WESTERN INDUSTRY

• *Automatic devices like this lorry bin and monorail speed operations in newest Western plants. For details see page 5.*

DECEMBER 1950

VOLUME XV
NUMBER 12

THE COMING MANPOWER SHORTAGE and what you can do about it . . . pg. 29

AIRCRAFT MAINTENANCE with emphasis on versatility and economy . . . pg. 34

There's more to a Wirebound box than wood, wire and price!

Experience, adequate plant facilities and container know-how are essential to soundly engineered, dependable containers. Cabco has been making wooden containers since 1883. Facilities embrace everything from logging to the finished wirebound. Cabco is the West's recognized leader in designing, developing and supplying wooden shipping containers.

New 20-lb. Cabco wirebound "cradles" 150-lb. rolls of Kaiser Aluminum foil

Kaiser Aluminum & Chemical Corporation said: "Nothing must touch the surface of these 150-lb. rolls of aluminum foil. They must have 100% protection during travel and storage." So Cabco designers engineered a new kind of wooden wirebound container. A pair of crossed-grain double end pieces suspend the core on which the rolls are wound. Then an extra-strong Douglas fir and wire wrap-around binds the whole into a compact, easily handled, and extremely rugged container. Kaiser officials say the new Cabco wirebounds occupy less storage space, assemble more quickly, and weigh 40% less than comparable nailed boxes. Container durability is such that the Cabco wirebounds are regularly returned to Kaiser for re-use.

This is but one of the many new industrial applications for Cabco wirebounds. Perhaps Cabco containers can increase the economy and convenience of your shipping operation.

2171

CABCO CONTAINERS

A product of the California Barrel Company, Ltd.

Sold only through

DUFF CALIFORNIA CO.

100 Bush Street, San Francisco 4, California
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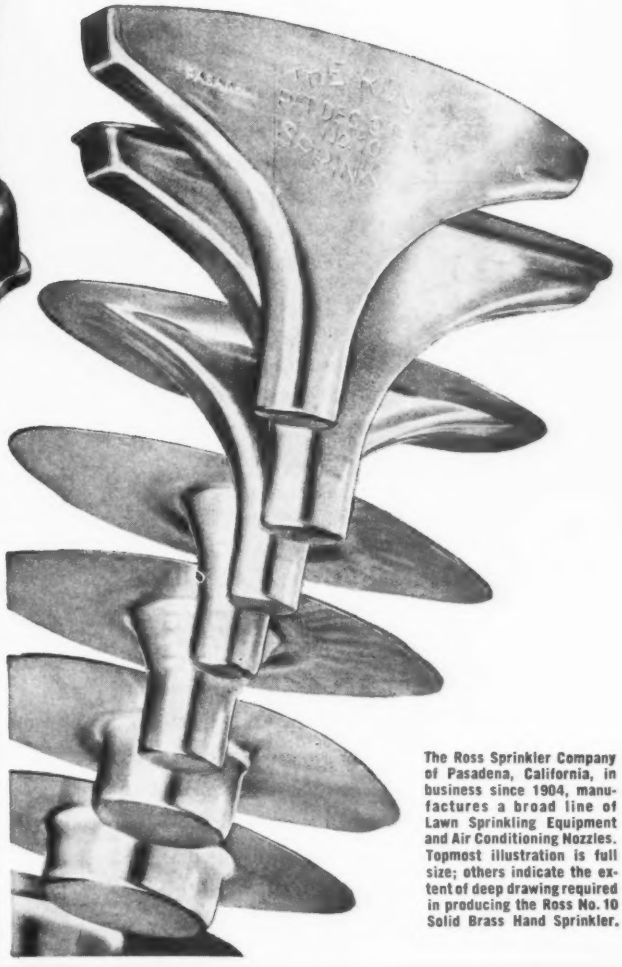


ROSS SPRINKLER MAKES AN ANNOUNCEMENT:

"We say -- without hesitation -- that the brass Anaconda supplies for these sprinkler heads gives us the best drawing performance and the lowest reject rate of any brass we've ever used".

This was no accident. The customer's equipment, together with the number and extent of draws, were carefully considered. Then a brass alloy of suitable composition and temper was supplied. Results were evident immediately.

How about those deep-draw jobs of yours? Any room for improvement? Want the benefit of our experience — without obligation? . . . Just write to The American Brass Company, General Offices, Waterbury 20, Connecticut. In Canada: New Toronto, Ontario. 50103

The Ross Sprinkler Company of Pasadena, California, in business since 1904, manufactures a broad line of Lawn Sprinkling Equipment and Air Conditioning Nozzles. Topmost illustration is full size; others indicate the extent of deep drawing required in producing the Ross No. 10 Solid Brass Hand Sprinkler.

for better drawing brass

SPECIFY

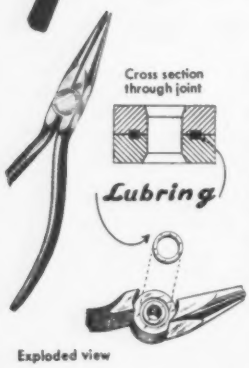
ANACONDA®

first in copper, brass and bronze

NEWS FROM UTICA

Pioneering and improvements it will pay you to know about

1 PLIERS WITH BUILT-IN LUBRICATION . .



The finest pliers—the LUBRING line—have a ring of oil-impregnated porous iron floating in the joint. The ring slowly feeds lubrication and assures smooth action, long life. Standard equipment for several top utilities.

2 NEW SAFETY AND COMFORT IN SPECIAL HANDLES

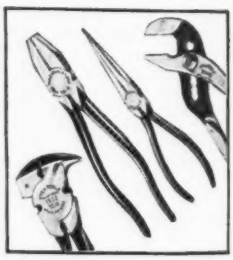
Heavy rubber vulcanized handles for insulation—slip-on plastic handles that are non-burning, non-explosive—dipped plastic handles for comfort—handle springs for ease in use. For almost all UTICA tools.

3 WRENCHES THAT LAST TEN TIMES AS LONG . .

Adjustable wrenches with electronically hardened jaw *surfaces.* Resist burring and nicking. Last up to 10 times as long. Their thin pattern was designed to reach the hard-to-get-at places—with *plenty* of strength!

4 80 TOOLS . . 151 SIZES. THE RIGHT TOOL FOR YOUR NEED

You get *exactly* what you want from UTICA! A full line of pliers and adjustable wrenches. Every tool checked in every step of manufacture, and *tested.* For long-run economy in your production line.



Utica Drop Forge & Tool Corporation, Utica 4, N. Y.

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It pays to use U TI CA quality tools

AND THE WORLD'S BEST TOOLS ARE MADE IN U. S. A.

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25c per Copy $2.00 per Year

Published Monthly by
KING PUBLICATIONS
609 Mission Street
San Francisco 5, Calif.
Telephone YUkon 2-4343

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WESTERN INDUSTRY

VOLUME XV DECEMBER · 1950 NUMBER 12

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THE ANNUAL INDEX of material published in *Western Industry* during 1950 is now available to our readers. Including articles, authors and subject matter, it is extensively cross-referenced so that you can find what you want when you want it. A copy of the index is yours for the asking. Write for it now.

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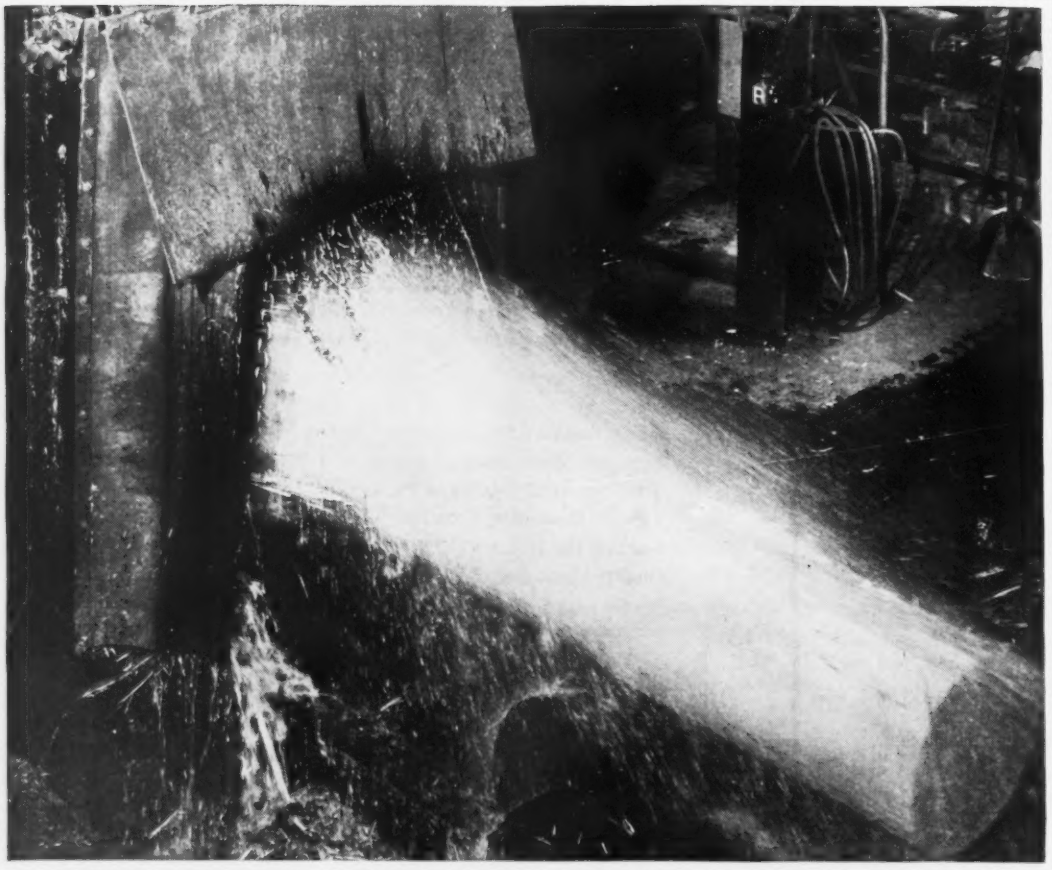
Front Cover

Typical of latest handling methods is this scene in new General Foods plant at San Leandro, Calif. Control panel governs filling of lorry buckets with measured and automatically weighed Jell-O ingredients and motor-driven movement of buckets by monorail to mixing stations.

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

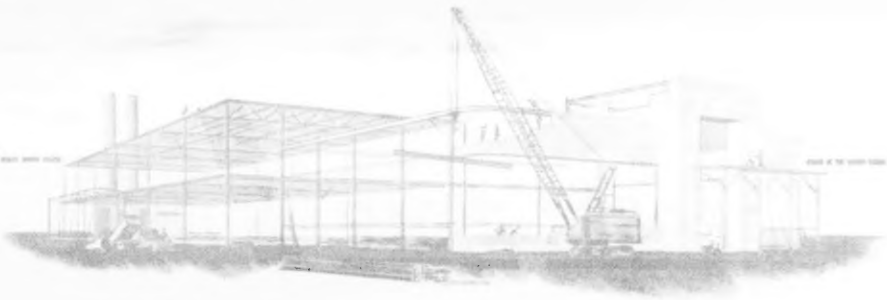


Water-jets rip off bark like a banana peel . . . One man at Westinghouse control-station runs it.

WESTERN LUMBER—NEW PLANTS, NEW MACHINES, NEW RECORDS

Right up in front with the leaders of booming Western Industry are lumber and lumber products. Since '39, plants have more than doubled and productive value has zoomed four times higher—to about one billion dollars annually.

New Westinghouse developments help mills produce faster and cheaper, help the industry grow. In the big machine above, for example, water-jets rip into logs up to five feet thick, skin off the bark like a banana peel. Moving and rotating the log under the jets is a tricky control problem. Westinghouse designed a drive, now the industry standard, which reverses direction and changes speed to handle various size logs. It speeds up and slows down fast, barks more logs per hour. All controls are in one place, run by one man. This is the kind of engineering (and it can be applied to your problem) that sparks Western growth.



Why 9000 New Western Plants Since '39?

When census takers made the rounds of Western industry in 1939, they came up with a total figure of 20 thousand plants. They made another count in 1947. The figure this time: *29 thousand.* Those 9000 new plants in eight years represent a growth rate 25% above that in the rest of the country!

Why so much more activity in the West? The chief reasons: rich markets, good raw materials, vigorous people, low-cost power. And the best part is that growth creates *more growth.* One new average-sized plant writes about $200,000 worth of paychecks per year and spends around one million annually in trade expenditures. So the plant generates the capital to finance the *additional* new plants needed to supply it!

Many organizations and individuals make up the force behind Western growth. A big component came from Westinghouse. Our eight Western plants in themselves are a significant factor in Western productive capacity. And these plants turn out goods vital to the growth of *all* Western industry—efficient power-generating apparatus, the best in electrical using equipment.

Westinghouse has a long-range stake in the West—and a basic understanding of the problems of making and using Western power. Your Westinghouse office is a good place to go for electrical help. J-94836

Plants at: Berkeley, Denver, Emeryville, Los Angeles, Portland, Salt Lake City, Seattle, Sunnyvale

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A MAJOR FORCE IN WESTERN GROWTH

doing this *costs more* now!

You do it less often

by using Dependable Quality

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That's why more Crane Valves are used than any other make

. . . this valve likes tough throttling jobs

—And for durable, maintenance-free service, it's typical Crane quality. The plug-type disc and seat construction in Crane No. 14½P's utilizes the toughest combination of metals found in 150-Pound brass valves. Extra wide seating surfaces give high resistance to damage by "wire drawing" or foreign matter. Crane disc taper is precisely correct for accurate flow regulation.

Whether you need throttling valves or any other type, you'll pay less in the long run by insisting on Crane Quality. Get a demonstration by your Crane Representative.

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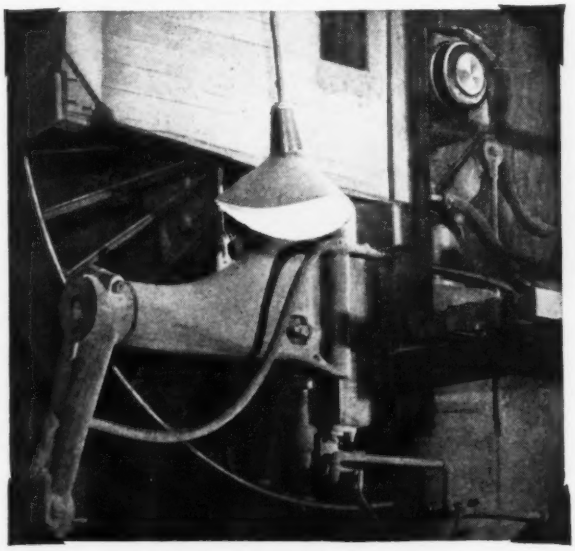
STANDARD ENGINEER'S REPORT

DATA

LUBRICANT	Calol Vistac Oil
UNIT	Main bearing-Sawmill Head-Rig Wheel
LUBRICATOR	Drip-feed oiler
CONDITIONS	Heavy pressures and tension—intermittent loads
PERIOD	2 years
FIRM	California Door & Lumber Co. Diamond Springs, California

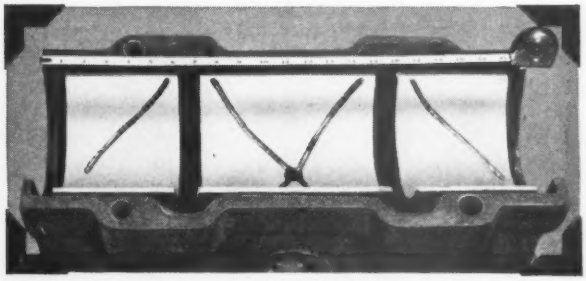
Tacky oil stops heavy-duty bearing failures



LUBRICATED WITH CALOL VISTAC OIL, the bearing in the 7-foot wheel of this head-rig has been in continuous use for more than two years. Before the sawmill changed to CALOL VISTAC Oil, the bearing had to be replaced every few months.

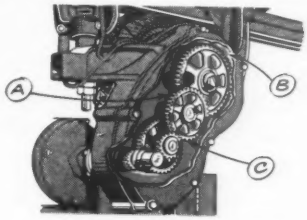
Mr. William Liddicolt, Mill Superintendent, says, "CALOL VISTAC Oil sticks tight, lubricates the entire bearing surface and doesn't squeeze off even under loads of 20,000 to 50,000 pounds. I also use CALOL VISTAC Oil on bearings in slashers and the hog. It really stands up under the continuous shock loads on hogger bearings!"

REMARKS: This plant has two band mills with 60-foot saws; handles heavy pine and fir timber. By keeping the bearings in these mills in good condition, CALOL VISTAC Oil has not only cut operating costs but prevented possible injury to personnel from saws that usually break when bearings go out.



THE HEAD-RIG WHEEL BEARING in this mill is 7" in diameter, 21" long, babbitt lined, and has two oil rings. Because CALOL VISTAC is tacky, it carries over bearings, keeps tops lubricated, maintains a rust-proof coating during shutdowns.

How CALOL VISTAC Oil Cuts Costs on Metal-Machinery Equipment



Saves wear, prevents failure of bearings and gear trains in machine tools and press machinery; excellent air-tool lubricant. Note diagram of hoist gear unit for overhead crane:

A. Special additives in CALOL VISTAC Oil help form pressure-resistant lubricating film.
B. Economical — small quantity will lubricate efficiently, dissipate heat.
C. Tenacious film cuts power loss and wear.

STANDARD TECHNICAL SERVICE: checked this product performance. If you have a lubrication or fuel problem your Standard Fuel and Lubricant Engineer or Representative will give expert help; or write Standard of California, 225 Bush St., San Francisco 20.

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STANDARD OIL COMPANY OF CALIFORNIA

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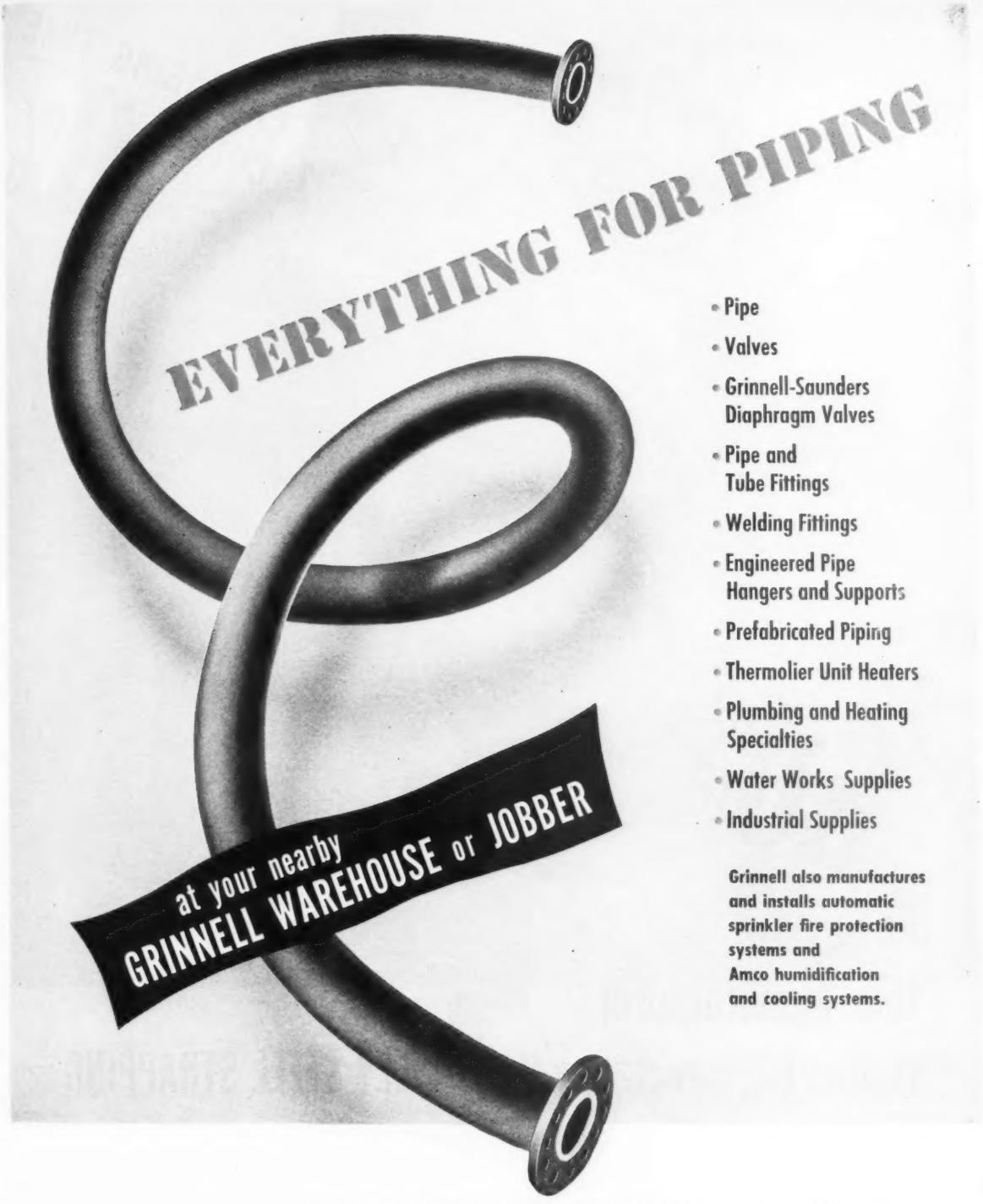
Call In Your Insurance Agent or Broker

The planning and installation of employee-protection plans is an increasingly important function of management. Your best source of information and counsel is your insurance agent or broker. Get his advice today!

Group insurance builds morale, helps establish financial security, and makes for greater efficiency among employees . . . Your insurance agent or broker can give you information on the modern group insurance plans underwritten by the sponsor of this message.

CALIFORNIA-WESTERN STATES LIFE INSURANCE COMPANY

Home Office, Sacramento



- Pipe
- Valves
- Grinnell-Saunders Diaphragm Valves
- Pipe and Tube Fittings
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Grinnell also manufactures and installs automatic sprinkler fire protection systems and Amco humidification and cooling systems.

More than 1000 Grinnell warehouses and jobbers . . . one within easy reach of your phone . . . are ready to give you prompt delivery on any standard piping product. When the job calls for specialized piping products or installations, Grinnell has the manufacturing facilities, products, experience and engineering knowledge to "deliver the goods".

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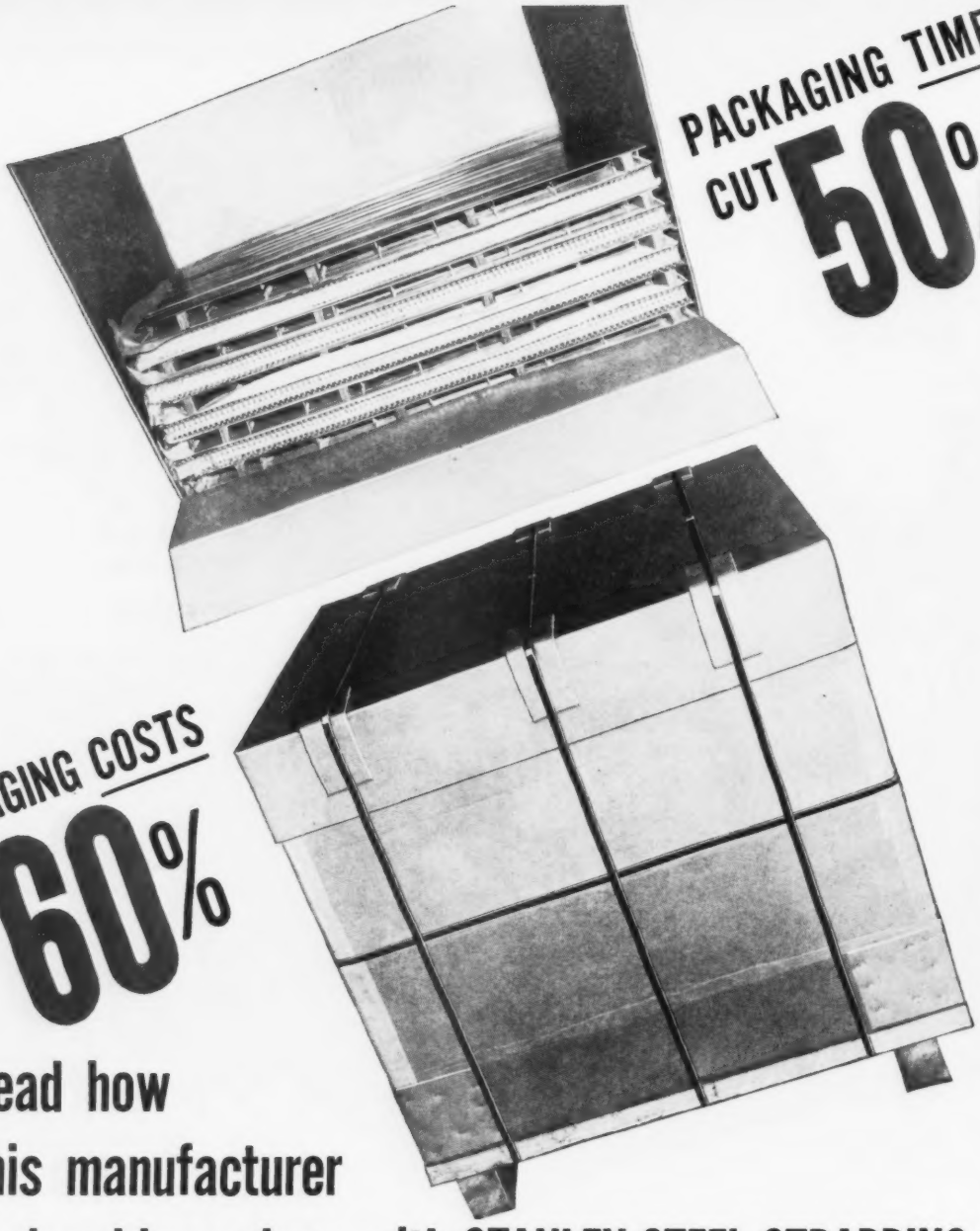

PACKAGING TIME CUT 50%

PACKAGING COSTS CUT 60%

Read how this manufacturer makes big savings with STANLEY STEEL STRAPPING

You know that waste of time, labor and money packaging any product can cut deep into over-all profits. This typical case history shows just how big a saving the Stanley Steel Strapping System can make.

The Keystone Metal Moulding Company of East Detroit, Michigan, cut packaging time 50% by change from small cartons to large carton on a skid. New carton is closed, reinforced and bound to the skid with Stanley Steel Strapping. Packaging costs reduced a full 60%.

Figures like these from manufacturer after manufacturer who has switched to the Stanley Steel Strapping System tell a story you can't afford to ignore. Whatever your product — no matter how big or how small — check on the savings Stanley Steel Strapping can make in *your* Shipping Room.

Write for full details or have a Stanley representative call now. The Stanley Works, Steel Strapping Division, 234 Lake Street, New Britain, Connecticut.

Stanley Steel Strapping announces the appointment of Buehrer Associates, Inc. as representatives for San Francisco and Northern California.
Seattle Office: 618 2nd Avenue • **San Francisco Office:** 527 Folsom Street • **Los Angeles Office:** 108 W. 6th Street

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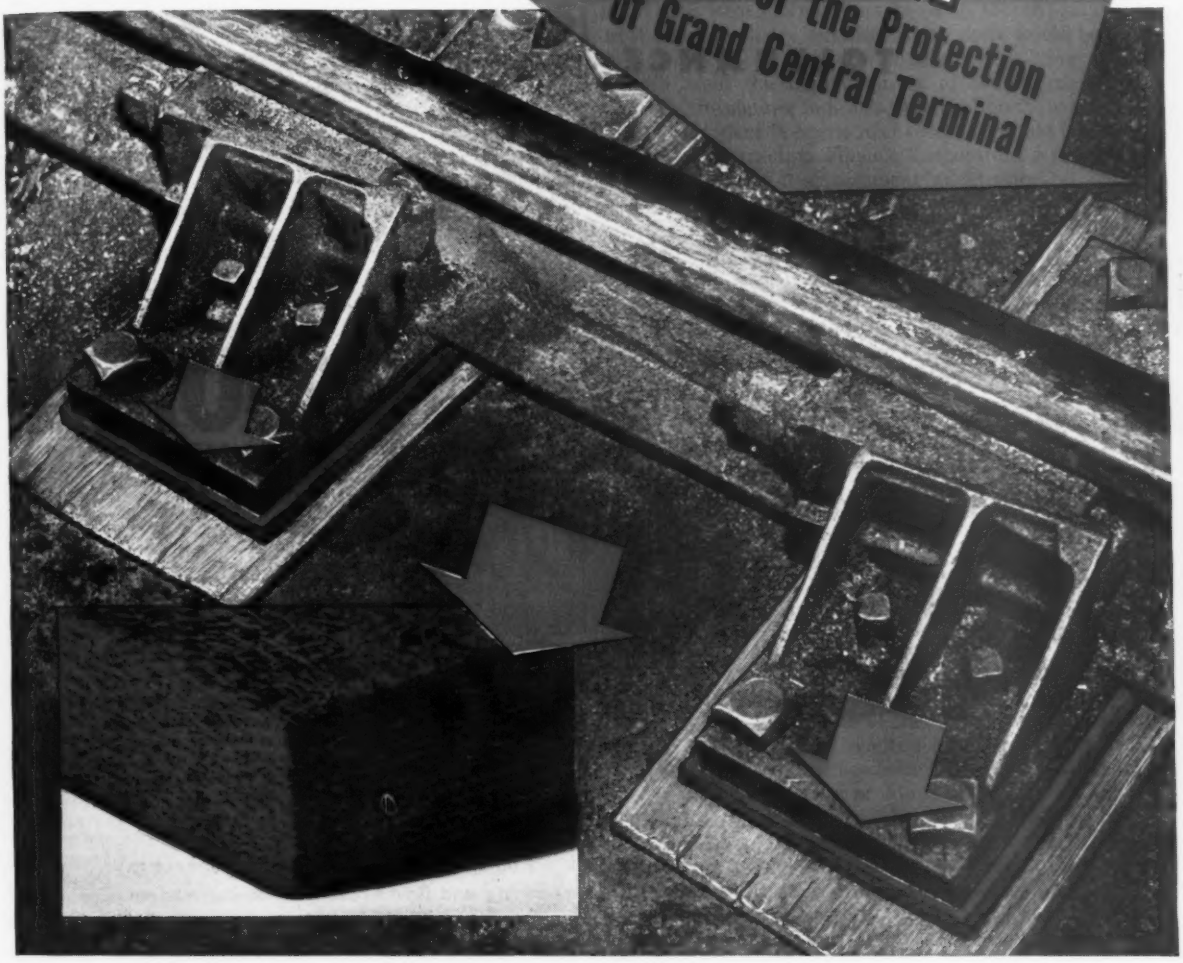
Reg. U.S. Pat. Off.

STEEL STRAPPING AND CAR BANDING SYSTEMS

HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL

FELT
is part of the Protection of Grand Central Terminal

Close-up of tie plate and felt pad. The facilities of Grand Central Terminal are shared by The New York Central and the New York, New Haven & Hartford, two of America's great railroads, serving our five plants.



● Passengers who use the famous Grand Central Terminal in New York City never know that they are riding on felt, but such is the case. Felt pads are installed under the tie plates that hold the rails to the ties. Felt is used here to lessen the transmission of vibration to the structure of the Terminal, which has tracks on two levels, one above the other. In this application, felt probably meets its most severe test in vibration control. Another function of the felt is to reduce noise. Felt by American serves perfectly here, and lasts amazingly long, even under loads running as high as 25,000 pounds on each electric locomotive driving wheel. Replacements have been due chiefly to changes in rails and in tie plate design—the felt in some cases actually lasts as long as the steel rails! . . . If you have a problem in vibration control, get in touch with American Felt or any of its Sales Offices.

American Felt Company
TRADE MARK

Quick Delivery

Stocks of American Felt are maintained in San Francisco, Los Angeles, Portland and Seattle, for the convenience of Pacific Coast customers. For Quotations, Samples and Data Sheets fill in coupon below.

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Company_____

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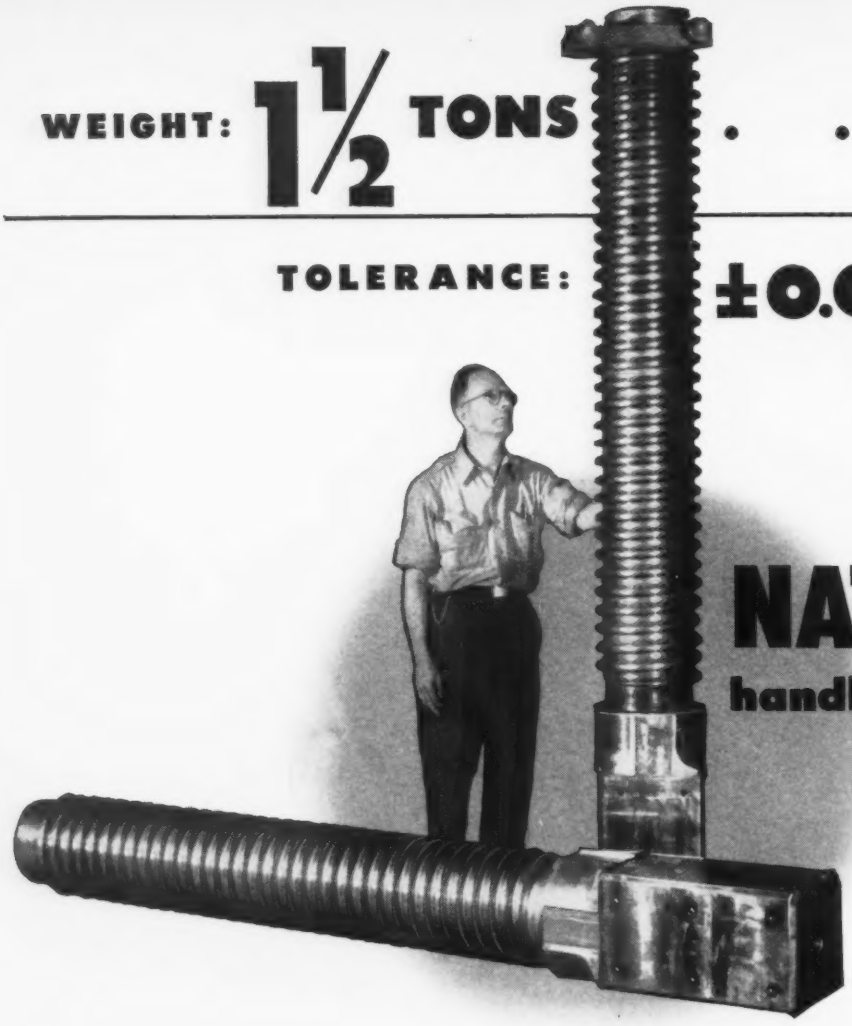
WEIGHT: 1½ TONS . . .

TOLERANCE: ±0.005" . . .



NATIONAL
handled the job

From 3 tons of steel came these two Housing Screws with hardened threads, built to ±.005" tolerance at National's Torrance Plant.

They're typical of the many and varied types of heavy manufacturing jobs National handles. They're also typical of the close tolerances National can work to when the job requires precision.

Every operation, from electric melting furnace to machining and finishing, is done in our modern integrated machinery manufacturing plant, the largest in the West.

Call us the next time you have a big or tough manufacturing problem. Meanwhile, send for our free booklet, "From Melting Furnace to Finished Product".

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Industrial Products Division
Torrance, California • Los Angeles Area
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BILLETS AND LARGE BARS
STEEL CASTINGS AND SPECIAL MACHINERY

THE NATIONAL SUPPLY COMPANY

MELTING • FORGING • CASTING • MACHINING
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IN OUR MAILBOX

Progress . . . With Thanks

Editor, Western Industry:

The interesting covers on your magazine *Western Industry* have encouraged me to write you concerning our industrial facility here in Fresno. We have one of the largest independent opthalmic prescription grinding factories in the West. It is a quarter of a million dollar project, that sprang from the grass roots over a thirty year period, in the San Joaquin Valley. It is located on a two-acre site with a modern building of 15,000 square feet, employing 70 people.

Recently we made a complete survey of our industrial facility to offer our services to the Munitions Board Production Allocation Program.

This was the outcome of reading your October issue concerning "War Orders—Will you be ready for them." We have made a great deal of progress since that time and it has been very helpful to us in starting us along in this line.

During World War II, we were suppliers for the Armed Services and manufactured over 40,000 prescription ground lenses for the Armed Services and we are planning to get back into full production when the time comes in serving this group.

WILL OLSON,
Sales Manager,
Progressive Mfg. Co., Inc.
Fresno, California.

* * *

Engineering Profits

Editor, Western Industry:

The survey you have conducted is very interesting, the percentages for the Southern California area are particularly noteworthy and tend to underline the industrial development of this region during and after the War. Although I do not know of any survey such as yours in the Middlewest or East, my personal experience leads me to believe that the percentages might be considerably lower than those for Southern California. There are a great many small companies (less than two hundred employees) which have not awakened to the fact that efficient engineering, of which a time study and labor standards are certainly a part, can bring a more profitable business, and eliminate a round of risks which otherwise of necessity would have to be encountered.

KARL A. PANITZ, Chief Engineer,
National Motor Bearing Co., Inc.,
Redwood City, California.

* * *

Distinction by Definition

Editor, Western Industry:

The distinction between "pollution" and "contamination" is made a point of considerable importance in the California law.

This appears to me to be a distinction by definition only, since usually the terms are considered to have the same meaning. I can see no objection to such a distinction, although frankly I can see no objection in it. Bacterial pollution or contamination is an important phase of pollution control and is so recognized in the State.

However, there are other phases of pollution which we in Washington consider important, such as that pollution which affects our fisheries resources, our tourist industry,

Continued on page 17

EDITORIAL COMMENT

Looking Back . . . and Looking Ahead

IF THERE were a "Ten Years Ago This Month" column in *Western Industry,* needless to say there would be no entry for December 1940 forecasting the building of a steel mill amid the orange groves of San Bernardino County, California, nor indicating the likelihood that some day an independent Western steel company would be handling the Reconstruction Finance Corporation a $91 million check to clear off its government indebtedness.

Back in 1940 industrialization of the West was a vision seen only by a few, and whether even these few, whoever they were, visualized that so much would take place in ten years is highly questionable. If Henry J. Kaiser keeps a diary, it would be highly enlightening to know just when he jotted down his first thoughts about steel mills, shipyards, aluminum and automobiles. Equally interesting would be the diaries of U. S. Steel Corporation directors indicating just when they began to realize the Geneva steel mill was a prize package instead of a white elephant. Or when Kennecott Copper first thought of plunking down $16 million for an electrolytic refinery in Utah instead of back East. Or when . . . (the list is starting to get too long already to hold within the type limits of this page, so we had better stop).

Nowadays we accept the developments of the last decade as wholly natural, perhaps even bordering on the commonplace. But where will we be in 1960?

Squawking Sensibly

MUCH management squawking about governmental waste is itself a waste of time; some of it is also an insult to the listener's or reader's intelligence. It makes no more sense than most squawks from the other side of the fence about "swollen profits." The Merchants and Manufacturers Association of Los Angeles has not been entirely innocent in the past of aimless squawking against the government, but now the M&M seems to be getting down to cases. In a recent release the M&M says:

"Investigators of the Appropriations Committee, looking into budget requests of just *one* of the many government bureaus and departments, uncovered these startling facts about the Bureau of Entomology and Plant Quarantine:

"Requesting funds for 63 new automobiles, their Denver office, according to congressional investigators, had 217 autos for 35 personnel; 194 of them unused in the first four months of 1949.

"The bureau, reportedly rented a DC-3 airplane for use at $450 per hour—$300 over airline charter rates. A Bureau-owned airplane was located, but in 27 months it had only been flown 30 hours."

That kind of squawking, kept up, will get results.

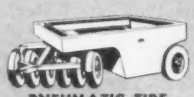
Knowing the Signals

"TOO MANY managements in America today are expecting employees to play on the free enterprise team and reject Communism or other destructive movements, without telling their players the signals for the game . . . They must know the production standards, the distribution of the sales dollar, the company's economics, advertising campaigns, contemplated expansions, new products and all policies and practices affecting them and their work." —EARL G. PLANTY, *executive counselor, Johnson & Johnson.*

WATERTUBE, FIREBOX, H.R.T. BOILERS and STOKERS

TANKS—STORAGE, BLOW-OFF, PRESSURE, etc.

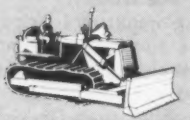
SPECIAL CYLINDERS, VESSELS of HEAVY STEEL PLATE



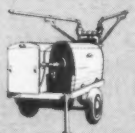
PNEUMATIC TIRE ROLLERS

SNO-FLYR ROTARY SNOW PLOWS and LIGHT BLADE PLOWS

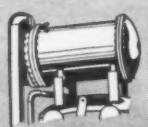
PORTABLE STEAM BOILERS, SEMI-TRAILER or SKID



HYDRAULIC BULLDOZERS, STRAIGHT or ANGLE



BITUMINOUS CIRCULATORS and HEATERS



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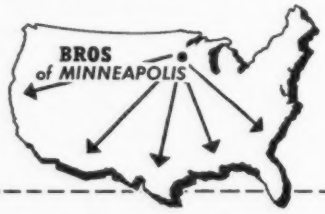
Mail the coupon below, or write us about your situation. You'll get a frank, honest reply at no obligation. Do it today, won't you?



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Continued from page 15

etc. Distinction could be made in these phases, as well as to separate out bacterial pollution. Such a separation or distinction as is made is good if the object is to place emphasis on the health angle of the pollution control program. However, if the object is to deemphasize industrial pollution, as it well may be, we do not favor the distinction.

E. F. Eldridge,
Director and Chief Engineer,
State of Washington
Pollution Control Commission,
Olympia, Washington.

* * *

Obstacles

Editor, Western Industry:

I have read with interest the article on pollution control in California which appeared in the August issue of *Western Industry* and Mr. Youngman's letter which was published in the October issue. The division of the responsibility for the development of programs and the enforcement of the law between the State Department of Health and a separate water pollution control agency is not unusual, but it may present obstacles which are difficult to overcome. The experiences gained in California under such an arrangement will certainly be of interest to everyone engaged in pollution control activities.

Curtiss M. Everts, Jr.,
Secretary and Chief Engineer,
Oregon State Sanitary Authority,
Portland, Oregon.

* * *

Wants Pallet Info

Editor, Western Industry:

I am superintendent of a terminal here in Oakland as per the booklet enclosed and am very much interested in securing information on the one trip pallets of the fibre type. I know from previous articles that there have been some success with fibre pallets and I would like to know if your organization can give me any further information as to where I can secure additional help on developing the type of pallet which would be sensible for our use here.

Our problem up to now is to find a pallet that has been possibly developed with enough strength to allow tiering to a height of three and four pallet loads of a ton and a half each and also have this pallet be a fairly inexpensive article.

Thanking you for any information you can give me, I remain

Peter Howard,
Howard Terminal, Oakland, Calif.

* * *

100,000 Pages

10/18/50

Editor, Western Industry:

Please send us 10,000 reprints of the September article entitled "GREASE: There's More To It Than Meets The Bearing," with our plate on front cover of the 4-page folder. Advise price, and probable shipment date to undersigned.

10/19/50

Editor, Western Industry:

Re: reprints of GREASE article.

Our client has decided they want 25,000 reprints rather than 10,000. Will you kindly make this change in our order of October 18, advising us of the cost and approximate date.

Edward S. Kellogg Company,
Los Angeles.

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Announcing the new, *all new,* Appleton 7S Portable Reelite—a compact, automatic cord take-up reel that solves the countless lighting problems of car-loading, machine inspection, maintenance work—any job that requires good illumination in out-of-the-way places.

Double silver alloy collector brushes—one of many outstanding new features—permit continuous rotation of the entire reel in either direction without power interruption or tangling of the cord. This versatile device furnishes light—or a flexible power source for power tools—when and where you want it. Positive stop action holds cord at desired length; then cord is automatically re-reeled when job is done.

The Appleton 7S Portable Reelite is completely encased in steel, finished in baked hammertone enamel. It is easily installed on any 4" octagonal outlet box. Available accessories include six types of handlamp, machine tool connector body or key socket. A vaporproof model is furnished complete with handlamp. Write for full details on this and other Portable Reelites.

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CALENDAR OF MEETINGS

Dec. 27-29—Northwest Scientific Association, regional meeting at Hotel Davenport, Spokane, Washington. Contact L. C. Cady, University of Idaho, Moscow, Idaho.

1951

Jan. 18-20—California Society of Professional Engineers, at Hotel Whitcomb, San Francisco. Convention and industrial exhibit. Contact C.S. P.E., Room 9028, Palace Hotel, San Francisco. EX 2-7443.

Jan. 30-31—Society for Advancement of Management's Clinic for Western Industry, at Los Angeles, under sponsorship of L.A. chapter. Contact George H. Pickett, c/o Southern California Gas Co., 810 South Flower St., L.A. 17.

Feb. 1-3—California Motor Transport Assn., at San Francisco. Contact Larry Fites, 417 Market St., San Francisco.

Feb. 1-4—National Industrial Exposition and Conference, sponsored by National Association of Foremen, at Municipal Auditorium, Long Beach, Calif. Contact Natl. Industrial Exposition and Conference, Suite 505, 900 S. Serrano Ave., Los Angeles 6.

Feb. 8-10 — Sierra-Cascade Logging Conference, at Redding, Calif. Contact conference president Robert Grimmett, Pine Logging Co. of Calif., Fresno.

February 9-10—Oregon State Bottlers Assn. state meeting at Benson Hotel, Portland. Contact M. B. Ruvinsky, Mt. Hood Beverage Co., AT 2823.

Feb. 13-14—Washington Bottlers of Carbonated Beverages, state conference at Hotel Davenport, Spokane, Washington. Contact Dave Allen, Jr., 714 American Bank Bldg., Seattle.

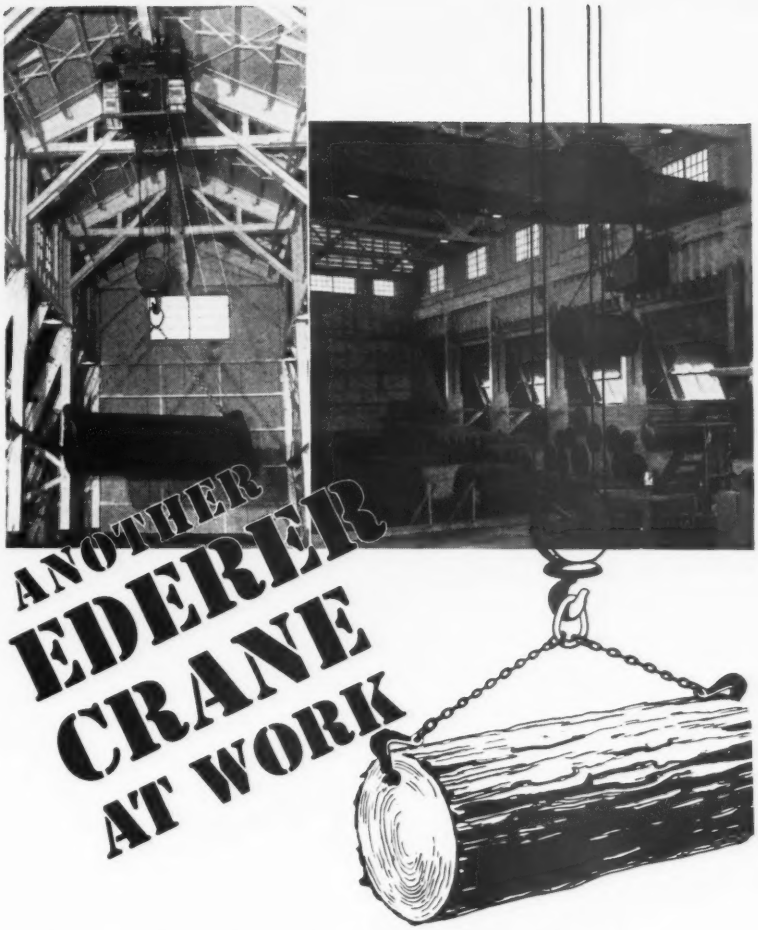
Feb. 14-16—Western States Meat Packers Assn., at San Francisco. Contact E. F. Forbes, Pres., 604 Mission St., San Francisco.

Feb. 26—March 2—5th All-Industry Frozen Foods Convention, at St. Francis and Palace Hotels, San Francisco. E. J. Watson, chairman.

March 6-7—National Marketing Conference, sponsored by U. S. C. of C., and hosted by San Francisco and Oakland C. of C., at St. Francis Hotel, San Francisco. Contact Dunlap C. Clark, Central Bank, Oakland.

March 12-14—Northwest Canners Association, regional meeting at Hotel Davenport, Spokane. Contact Mr. Tulley, Board of Trade Bldg., Portland.

March 15-17—Fifth Annual Industrial Electrical Show, sponsored by Electrical Maintenance Engineers Association of Southern California, at Shrine Convention Hall, Los Angeles. Contact George Larsen, Larsen-Hogue Electric Co., Los Angeles.



IN A WESTERN PLYWOOD PLANT

The EDERER crane and hoist shown here move peeler logs from log well to barker to lathe—with efficiency and economy—because they were custom-built to exact job requirements of the plant.

It is this custom-building ability—plus plant capacity—that has made EDERER one of the largest crane manufacturers on the Pacific Coast—with "know-how" and facilities to build any type of crane for any industry.

Many Western industries have for years been moving materials with EDERER custom-built cranes. An EDERER engineer will be glad to talk with you about your job requirements.

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161C50

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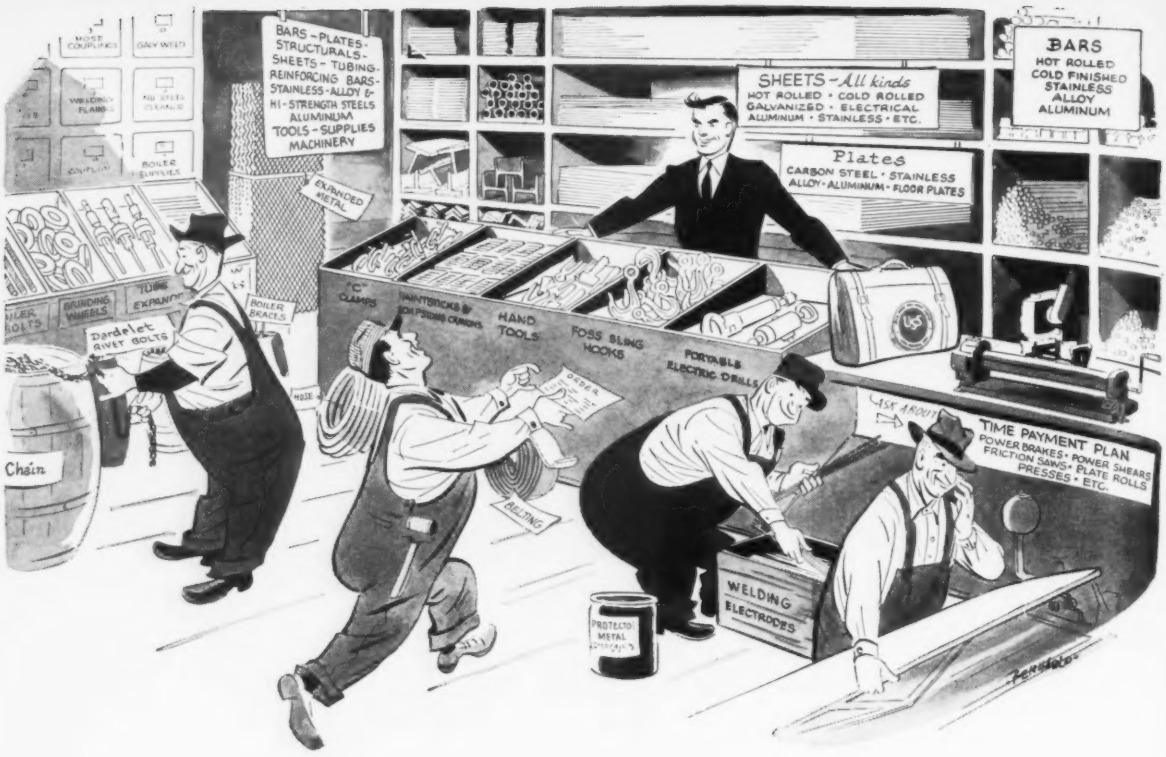

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UNITED STATES STEEL

Western economy runs up the score in 1950 and picked to do it again in 1951; Some Western steel may head east; Lumber market softens with many casualties among green mills; Manpower shortage plagues aircraft.

WHEN the years 1950 and 1951 can be looked upon in retrospect, it seems likely that 1950 will be classed as a period of reviving business and industrial activity in the West due to general causes, and that 1951 will be the time when conditions are greatly influenced by the international situation.

For example, the California State Department of Employment points out that by last May monthly employment totals were being boosted substantially beyond ordinary seasonal levels. Again, by the end of October the three Coast states, plus Utah, Nevada and Idaho, had exceeded their total 1949 building permits (Arizona did not quite make the grade). The ten-month total of $1,552,966,204 was 19.2% greater than the entire year of 1949, and 41.5% more than the similar period last year, according to *Daily Pacific Builder*.

Whether this means actually more physical structures than last year seems doubtful, in view of advancing construction costs. American Appraisal Company figures give the following index comparisons for construction costs in four Western cities (the indexes reflect cost trends in each city, but not relative costs between cities):

	Sept. 1949	*Sept. 1950*
Denver	439	472
Seattle	506	534
San Francisco	443	478
Los Angeles	474	503

Oil

Up again went the price of heavy crude oil on the West Coast, nearly restoring its historical relationship to other gravities of petroleum. Military ship movements to the Orient, plus heavy railroad traffic, had eaten

Continued on page 23

CONSUMERS' PRICE INDEX

From Bureau of Labor Statistics
100 = 5 yr. Avg. 1935-39

1950	Los Angeles	San Francisco	Portland	Seattle	Denver
Apr. 15	166.9	.....	174.8	.....	165.7
May 15	166.7	.....	.....	171.8	.....
June 15	166.7	173.1	.....	.....	.....
July 15	168.2	.....	179.2	.....	169.5
Aug. 15	169.1	.....	.....	175.2	.....
Sept. 15	169.5	176.0	.....	.....	.....

MANUFACTURING EMPLOYMENT

Estimated Number of Employees
Source: U. S. Bureau of Labor Statistics and State Agencies
(In thousands of persons)

	Sept. 1949	Sept. 1950
Washington	183.6	189.8
Oregon	140.3	147.4
California	747.6	843.3
TOTAL PACIFIC	1071.5	1180.5
Montana	20.1	20.1
Idaho	23.3	25.4
Wyoming	6.9	6.7
Colorado	57.1	62.7
New Mexico	11.2	11.8
Arizona	14.3	16.2
Utah	32.4	33.8
Nevada	3.0	3.2
TOTAL MOUNTAIN	168.3	179.9

Business Activity Indices

	July	Aug.	Sept.
[1]Arizona	367.3	370.8	383.6
[2]California	253.2	252.6	257.0p
[3]So. California	324.9	325.6	331.6p
[4]Pacific N.W.	240.5	242.9p	.....
[4]Puget Sound	231.2	240.1	.....
[4]Inland Empire	252.4	245.4	.....
[4]Lower Columbia	245.4	245.0p	.....

1. Valley National Bank (Phoenix) index, based on a weighted composite of retail sales, agricultural income, and employment in mining, manufacturing and construction, seasonally adjusted. 1940 = 100.
2. Wells Fargo Bank & Union Trust Co. index based on the following components: Industrial production, freight carloadings, bank debits, department store sales (weighted 4, 3, 2, 1, respectively, and adjusted seasonably).
3. Security-First National Bank of Los Angeles index, based on the following components and weights, and adjusted seasonally: department store sales, 15; building permits, 5; Los Angeles bank debits, 20; residential city bank debits, 5; agricultural city bank debits, 5; industrial employment, 20; industrial power sales, 13; railroad freight volume, 6; telephones in use, 7; real estate activity, 4.
4. Index compiled by Bureau of Business Research, University of Washington. Based on a weighted composite of population, value of manufactured products, dollar volume of wholesale trade, dollar volume of retail trade, dollar volume of service-establishment businesses, employment, and income. Weights were determined of the economic importance of each of the 3 regions of the Pacific Northwest based on these 7 indicators.

   For the Pacific Northwest as a whole, the three regional index figures are weighted as follows: Puget Sound Area, 43.7%; Lower Columbia Area, 37.1%; Inland Empire Area, 19.2%.

p Preliminary estimate.

WHOLESALERS' SALES

In thousands of dollars. Percentage changes are from corresponding month of preceding year. From Bureau of the Census.

MOUNTAIN

1950	Automotive Supplies	Change	Electrical Goods	Change	Furn. and house furn.	Change	Groc. and foods exc. farm. prod.	Change	General Hardware	Change
March	643	—23	3,671	— 2	1,202	+49	.....	.....	2,138	+ 2
April	907	+10	3,288	— 3	907	+20	.....	.....	1,998	— 8
May	781	— 6	4,050	+ 9	1,045	+43	.....	.....	2,157	+14
June	857	+15	4,074	+ 1	1,294	+15	.....	.....	2,186	+ 7
July	1,277	+47	5,347	+58	1,261	+40	.....	.....	2,488	+40
August	1,351	+59	5,457	+50	1,738	+90	.....	.....	3,125	+55
September	1,974	+ 5	5,052	+34	1,244	+28	.....	.....	2,734	+41

PACIFIC

March	2,320	— 2	14,254	+ 7	3,402	+27	.....	.....	7,371	— 2
April	1,437	—13	13,120	+ 3	3,124	+25	.....	.....	6,659	— 2
May	1,800	+ 9	14,510	+ 7	1,896	+39	.....	.....	7,953	+ 9
June	2,592	+ 3	15,062	+ 3	3,108	— 5	.....	.....	8,675	+ 7
July	2,919	+23	22,450	+80	3,902	+ 3	.....	.....	10,280	+81
August	3,522	+40	22,631	+65	5,299	+89	.....	.....	12,475	+86
September	2,950	+28	19,884	+33	4,154	+37	.....	.....	9,998	+39

Industrial Supplies	Change	Lumber and bldg. mat.	Change	Mch. equip. and supplies excl. elec.	Change
2,397	+ 9	2,371	+19	682	+ 8
2,272	+16	1,602	+21	716	+ 1
542	+19	1,707	+47	534	—18
710	+ 5	1,942	+ 7	565	—23
2,897	+60	1,674	+110	868	+99
4,225	+112	1,814	+10	975	+111
948	+52	1,823	+76	732	+97

INDEX NUMBERS OF WHOLESALE PRICES BY GROUPS OF COMMODITIES AND BY MONTHS

Bureau of Labor Statistics, Washington 25, D. C.
(1926 = 100)

1950	Farm Products	Foods	Hides and Leather Products	Textile Products	Fuel and Lighting	Metals and Metal Products	Building Materials	Chemicals and Allied Products	House Furnishing Goods	Miscellaneous	ALL COMMODITIES
April	159.3	155.3	179.4	136.4	131.2	168.7	194.8	117.1	145.8	112.6	152.9
May	164.7	159.9	181.0	136.1	132.1	169.7	198.1	116.4	146.6	114.7	155.9
June	165.9	162.1	182.6	138.6	132.7	171.7	202.1	114.5	146.9	114.8	157.3
July	176.0	171.4	187.1	142.6	133.4	172.2	207.3	118.1	148.7	119.0	162.9
August	177.6	174.6	195.6	149.5	134.4	174.3	214.0	122.5	154.1	124.3	166.4
September	180.4	177.2	202.8	158.2	135.1	176.7	219.6	128.5	159.2	127.4	169.5

Tenth in a series of Unusual Grinding Operations

Army Lifts Veil of Secrecy at Malta, Bares Rocket Progress
Adequate Defense Of U. S. Assured, Say Experts
By CON. HEFFERNAN
Times-Union City Editor
Trip to Moon Now 'Feasible' But Not Yet Probable

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7" x 3/16" x ⅞"	9" x 3/16" x ⅞"
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Grit sizes: 16, 24, 36, 54, 80 (Aluminum Oxide abrasive)

Specify Silicon Carbide abrasive for rust and scale removal. Stocked only in 16 grit, 9" x ¼" x ⅞" size.

WEST COAST DISTRIBUTORS

PACIFIC METALS COMPANY, LTD.

NORTHWESTERN TOOL & SUPPLY COMPANY

Continued from page 21

quickly into the vast oversupply that recently had filled western reservoirs to the brim.

Prices still are below those prevailing in early 1949, however. Some producers were disappointed in not getting a great boost, but major companies predict the rise should stimulate production from shut-in heavy crude-producing fields.

Gasoline supplies on the Pacific Coast have passed the seasonal low point without reaching a critical stage. For a short time, there was little more than a barrel of motor fuel in storage for every automobile in the State, a very low figure. Refining capacity has been lifted, however, and the biggest motoring months are past for a while.

It is estimated that Southern California refineries currently are handling nearly as much crude every 24 hours as all of Soviet Russia. Nearly half of the military's aviation fuel is being produced on the West Coast, which has only about 20% of the nation's producing and refining capacity.

Plans are made for a $15,000,000 refinery at Florence, Arizona, to be supplied with crude oil by a $70,000,000 pipe line from Scurry County, Texas, capable of carrying 200,000 barrels of crude oil a day. The plan depends on ability to get priorities for necessary steel.

Lack of drilling pipe is halting work on a number of leases in California. Protests have been made to the Commerce Dept. against shipments of U. S. pipe for a big new oil line through Iraq and Syria.

The 1,200-mile pipeline bringing gas from Texas to storage near Goleta and Playa del Rey, California, has just been completed, three years ahead of schedule.

General Petroleum has begun work on a new exploratory well in the Green River area of eastern Utah.

Coal

Shortage of rail transportation continued to hold down bituminous coal production in the intermountain area during October and November. Mines were generally operating from 3 to 3½ days.

NATURAL GAS

CALIFORNIA

(Compiled by Roy M. Bauer, gas supply supervisor, Southern California Gas Company)

(in thousands of cubic feet)

Number of Consumers	Sept. 1950	Sept. 1949
Domestic and Commercial	2,788,977	2,619,736
Industrial	6,954	5,920

UTILIZATION

	9 months, 1950	9 months, 1949
Domestic and Comm. Sales	196,003,279	194,207,992
Industrial Sales	117,134,146	94,020,456
Electric Generation	57,228,720	46,726,477
Net Receipts from Producers	390,012,776	354,392,293

BITUMINOUS COAL AND LIGNITE

(In thousands of tons—From Bureau of Mines)

	Aug. 1949	Total 8 mos. 1949	Aug. 1950	Total 8 mos. 1950
Colo.-N. M.	404	3,509	440	2,610
Wyoming	459	3,487	504	3,241
Utah	527	4,260	690	3,858
Montana	280	1,788	225	1,616
Wash.-Alaska	96	1,708	113	827

Electric Energy

Steam generated power, the old standby, has its troubles, too. Two 150,000 kw. generating units of Los Angeles Bureau of Water & Power at the Harbor plant were out of commission for weeks this fall, Southern California Edison had a 100,000 kw. station down also, and at San Diego there was also a generating unit out. Fortunately, this run of hard luck happened early enough so that repairs were made before the December peak. Even without this steam power, the Southern California area was taken care of, and there are no supply problems lying ahead. September figures for California show peak and energy as 8% and 7½% above 1949.

Hydro situation in the Pacific Northwest has been favorable this fall, with possibilities that there will be no brownout this winter. Reservoirs have been full and steam has only been required for peaking. September reports shows peak and energy 15% and 13% above a year ago.

Steel

Mills in the West probably will have to contribute a share of their output to national needs elsewhere in the country before many months, such as perhaps the shipbuilding and barge program on the Great Lakes. The Western mills already are booked for many months ahead and there is no sign yet of any slackening in demand for consumer durables. The housing program is not due to slow down until some time next year, so in the meantime the call for window sash, plumbers' goods, and pipe of all kinds continues strong.

PETROLEUM

(California, Oregon, Washington, Arizona, Nevada)

(From Bureau of Mines)

(In Thousands of Barrels Daily)

	Aug. 1949	Aug. 1950	Total 8 mos. 1949	Total 8 mos. 1950
Crude Production	896	899	7430	6980
Gasoline	374	417	2966	3422
Gas, Oil, etc.	109	106	1113	1236
Heavy Fuel Oil	317	331	2924	3258
ALL PRODUCTS	969	978	8091	9079

BANK DEBITS

Twelfth Federal Reserve District

(In thousands of dollars—total of major cities)

	Total 9 mos. 1950	Total 9 mos. 1949
Arizona	2,091,730	1,846,775
California	80,541,730	72,965,388
Idaho	808,083	754,977
Nevada	457,520	483,373
Oregon	6,935,854	6,357,455
Utah	2,985,312	2,774,206
Washington	11,515,802	10,583,264
Total	105,336,031	95,765,438

Percent change = +10.

While the supply of basic materials, such as ore, coal and limestone is still ample, the shoe may pinch through shortage of sulphuric acid, zinc for galvanizing, tin for tin plate, and other items.

One of Kaiser's two blast furnaces at Fontana was down for repairs for some weeks in the fall, but it was expected the furnace would be operating again in December. Geneva broke another production record for ingots in the week ending Aug. 24, of 32,495 tons, topping the week of May 13, when 31,480 net tons were produced. Output at Geneva's Ironton, Utah, plant totaled 21,844 net tons in September, exceeding the May record of 21,451 tons. Some European scrap has been imported for Pacific Coast mills, and battlefield scrap from the Pacific dribbles in. The mills in the West do not compete so fiercely for scrap as elsewhere, making for an easier scrap situation.

Aluminum

Impact of the cut-back in aluminum will probably be felt for the first time in January when the customary slow sales period is on. The cut-back percentages were based on the volume of business done in the first half of the year, which penalizes utensil and appliance manufacturers whose main business is done in the fall. Aluminum foil production at the Kaiser plant at Permanente, Calif., has doubled in the last two or three months.

Nonferrous Metals

Nonferrous metal production continued an upward trend during the past month. Copper properties generally were operating at capacity. Underground mines continued to increase production in response to government demands. The manpower situation is not yet serious but shortages are being felt in some areas.

ELECTRIC ENERGY

(Production for Public Use—in Millions of kilowatt hours.)

(Source: Federal Power Commission)

	Aug. 1949	Total 8 mos. 1949	Aug. 1950	Total 8 mos. 1950
Mountain	1,344	10,825	1,461	11,789
Pacific Northwest	1,702	13,727	1,858	15,145
California	2,132	15,122	2,455	16,401
Total Pacific	3,834	30,529	4,313	32,900

FREIGHT

Cars of revenue freight, railroad carriers in 11 Western States

Compiled from Assn. of Am. R. R. weekly reports

	1949 Sept.	1950 Sept.	1st 9 mos. 1949	1st 9 mos. 1950
Carloadings	684,714	764,238	4,876,354	4,822,337
Rec'd from East'n conn.	355,382	429,103	2,630,920	2,804,805

INDEX OF DEPARTMENT STORE SALES

(Index numbers, 1935-39 daily average = 100 with seasonal adjustment.)

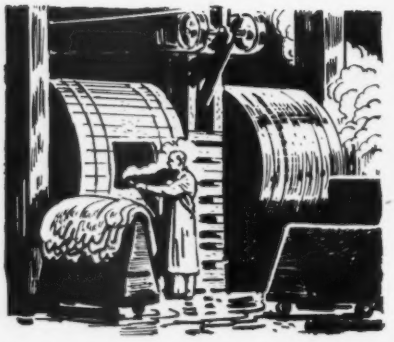
Compiled by Federal Reserve Bank

	Sept. 1949	Sept. 1950
Total 12th Fed. Res. Dist.	326	368
Southern California	358	407
Northern California	294	333
Portland	313	344
Western Washington	330	388
Eastern Washington and northern Idaho	362	398
Utah and southern Idaho	310	333
Phoenix	403	480

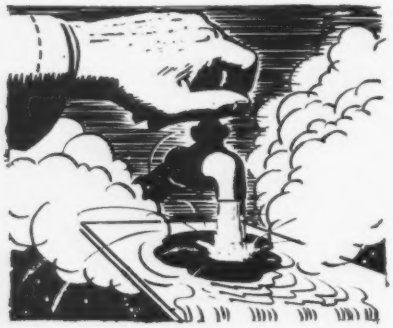
How to reduce your grease inventory and get better lubrication

UNOBA

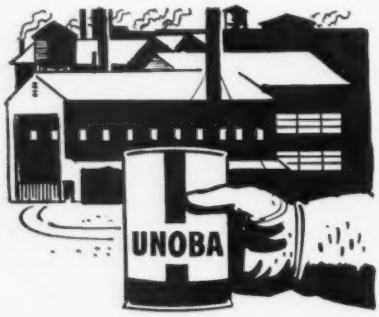
1. Plant operators in all types of western industry are proving that you can actually concentrate much of your grease inventory to multi-purpose UNOBA grease—and get *better* over-all lubrication performance than ever before, under all kinds of *heat* and *water* conditions.



2. For example, a large California tanning firm* now uses UNOBA in *all* of its plant operations. For the company has had outstanding success with multi-purpose UNOBA in the protection of bearings under severe *water* and *acid* conditions. **Name available upon request*



3. Just what is UNOBA? It's a *barium* base grease that assures proper lubrication under the most *severe* conditions. It sticks to metal surfaces with a tenacity that boiling water can't break! And it gives thorough protection at temperatures from below freezing to over 300 degrees F.



4. Because of this flexibility, multi-purpose UNOBA *simplifies* lubrication. It performs on jobs formerly requiring *many* different types and brands of grease. And this results in reduced inventories, smaller storage space, less chance of using the wrong lubricant, and *lower* maintenance costs.

Let your Union Oil Representative tell you the complete UNOBA story, or write Sales Dept., Union Oil Company, Los Angeles 17, Cal.

76 UNION OIL COMPANY OF CALIFORNIA

Aircraft

First long-term wage contract in the aircraft industry, providing a quarterly wage adjustment provision based on the BLS index of living, has been signed by North American Aviation with the CIO United Auto Workers. The company's 11,700 production and maintenance employees in the union bargaining unit thus will get 9 cents an hour more pay, 14 cents for a new classification, and increased insurance benefits. Coverage of the union shop will be extended. Salaried and weekly-paid employees likewise will get their pay raised. The deal covers the three plants in the Los Angeles area.

Quick to fall in line were Northrop and Hughes, the latter dealing with three AFL unions at its plant.

Manpower shortages are tightening up to the point where aircraft makers reluctantly are facing the necessity of lowering their hiring specifications. Plans are slowly incubating for training courses to upgrade present employees. Personnel men are being told they'll have to be less fussy.

Washington is warning that the serious lack of engineers, machinists, tool and die makers and electronics men may mean rapid-fire training courses, or better, initial efforts to get voluntary transfer of these skilled people from places where they could be spared to areas of greatest need—if there are such people to be found. After that, technicians will have to be trained up to the jobs, or else the jobs will have to be broken down into simpler ones.

Consolidated Vultee has cut back its 10-hour working day at San Diego to an 8-hour basis by reopening a closed plant where there is room for enough workers to permit a normal schedule. North American will take over a Curtiss-Wright plant at Columbus and will move some specialized and supervisory personnel from Los Angeles to staff it. Some work likewise will be moved there from southern California plants but the company isn't saying what kind.

Ryan has suspended production of its Navion personal business planes to devote its entire resources to military work.

Lockheed has announced a new Constellation, 18.4 feet longer and intended to

"bridge the gap between modern planes and the first American jet transport." Fifty million dollars' worth of orders for it have been received.

Aircraft makers have demanded priority ratings for air liners as necessary to keep civilian air transport flying. Railroad freight cars already had been provided for.

Unfilled orders for civilian transport planes are now largest in two years, totaling about $200,000,000 for nearly 200 airliners. Military transport orders are at a peak since World War II and are supposed to total more than four times the civilian airliner backlog in both number and cost.

Furniture

Despite some softening in retail sales, Western furniture manufacturers report no sizable amount of cancellations, and are still busy on a substantial backlog of orders. Pool car shipments, one of the best indices of the industry, are well above the seasonal average.

Only shortage to pinch seriously is that of foam rubber, lack of which is beginning to curtail this type of upholstering. At the same time, it has stimulated bedding production, since the latex mattress apparently is about to disappear.

Lumber

Tobogganing market of month ago seems less disastrous on resurvey. Badly hit were small rough green mills cutting dimension lumber. Many casualties. Housing cutback, car shortage, inadequate finances ganged up simultaneously and did lots of damage. Much distress selling. Much confusion. Main effect however seems to have been a knocking off of ridiculously high premium prices without much disturbance otherwise.

Market is now a bit softer, but more stable. However, slump had little or no effect on the higher grade "uppers," and one or two slight price increases have been noted there. Larger, more stable mills are operating at high capacity, and command the sales picture. Order files are reported not quite so full, but this is in large part seasonal —poor building weather and end-of-year reduction of inventories. Housing is a wait-and-see proposition until after New Year. Defense orders of little influence so far. General prospects are for some more year's end settling down and then strong again. Log prices are strong and inventories not too big. Some camps already down.

Plywood

Production continues to be strained to utmost capacity all up and down the Pacific Northwest coast. Prices are holding quite stable but demand continues very strong. Some new interest in defense orders and mills are reported to be arbitrarily allocating about 15% of production as standby for the military. Jobbers are finding more difficulty in placing orders in view of defense prospects. Order files at mills are well filled.

Prospects are that plywood will continue very strong and not be affected appreciably by slowed tempo in housing. Housing represents only one outlet for the very broad market plywood promotion has built up. Situation differs from lumber in that relatively heavy plant investment in plywood tends to reduce in-and-out operation; lumber industry, on other hand, automatically brings in hundreds of additional small units when prices boom.

Continued on page 27

IRON AND STEEL
WESTERN AREA OF THE UNITED STATES
From American Iron and Steel Institute (in net tons)

	Sept. 1949 Output	Sept. 1949 Per Cent of Capacity	Sept. 1950 Output	Sept. 1950 Per Cent of Capacity
Pigiron Output	162,007	67.8	253,774	91.6
Steel Output	328,549	76.1	472,671	99.7
Alloy Steel Output	4,097	.....	10,388	.....
Carbon Ingots, Hot Topped*	5,879	.....	11,590	.....
	Total 9 months 1949		**Total 9 months 1950**	
Pigiron Output	1,769,545		1,914,667	
Steel Output	3,502,778		3,948,057	
Alloy Steel Output	48,535		60,212	
Carbon Ingots, Hot Topped*	86,390		74,688	

*Included in total steel.

ETHYL ALCOHOL
(From Bureau of Internal Revenue)
Production *(in proof gallons)*

	Sept. 1949	Sept. 1950	Total 9 mos. 1949	Total 9 mos. 1950
DOMESTIC UNDENATURED ALCOHOL				
Calif.	527,974	464,977	4,160,236	4,369,510
Colo.	.....	.....	.....	.....
Wash.	214,617	438,636	2,555,296	3,579,780
DENATURED ALCOHOL				
Calif. (Compl. denatured)	2,418	27,526	196,540	112,290
SPECIALLY DENATURED				
Calif.	211,084	397,124	2,306,925	2,892,679
Utah	.....	.....	.....	.....
Wash.	16,242	16,251	122,554	147,006

CEMENT
(In thousands of bbls.)
From U. S. Bureau of Mines

	Aug. 1949	Total 8 mos. 1949	Aug. 1950	Total 8 mos. 1950
Calif.	2,356	15,104	2,614	17,609
Ore.-Wash.	778	4,452	925	4,362
Colo.-Wyo.-Mont.	664	3,919	912	4,839

AIR FREIGHT
(In pounds. Figures from airports)

1950	Los Angeles In	Los Angeles Out	San Francisco In	San Francisco Out	Oakland In	Oakland Out	Portland In	Portland Out	Seattle In	Seattle Out
September	1,373,150	1,631,616	1,597,249	1,669,936	620,581	523,798	.....	.....	665,085	1,058,178
Total 9 months 1949	10,736,963	10,677,758	9,887,070	11,282,538	997,262	1,512,872	.....	.....	*	*
Total 9 months 1950	11,306,517	12,562,605	10,677,005	12,820,154	2,469,490	2,963,308	.....	.....	*	*

*Not available.

How the BWH ROTOCURE PROCESS eliminates OCS*

— a major cause of Premature Belt Failure

IN every 30 to 40 feet of belting cured by the flat press method, there's a 2″ to 4″ danger zone which often means trouble ahead. These zones consist of overcured or doubly cured segments — the result of "stop and go" vulcanization in which the previously cured portion is advanced *less* than a press length. These overcured sections constitute a mere 1/240th to 1/90th of the belt but invite serious surface wear and structural weaknesses that can cause early failure of the entire belt!

Not so with BWH ROTOCURED belts, however. They are the only belts made by a continuous, never-ending curing technique. THERE ARE NO OVERCURED SEGMENTS. ROTOCURE (even, uniform cure) benefits users 4 specific ways as it steps up efficiency and cuts belt maintenance costs. RESULT: *LOWER COST PER TON OF MATERIAL CONVEYED!*

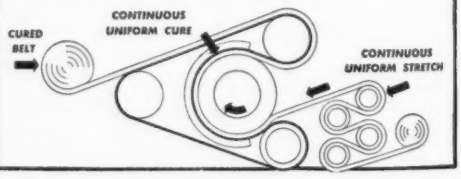
1. **Because there is no double vulcanization, uniform abrasion resistant covers are always assured.**
2. **Continuous vulcanization eliminates overlaps which can reduce flex life up to 40%.**
3. **Mechanical distortion (inherent with flat press curing at the press ends) is eliminated.**
4. **Constant, uniform stretch results at all times.**

BWH ROTOCURED BELTS will give you appreciably longer performance, lower your costs and spare you maintenance headaches. Remember, only BWH Conveyor belting offers you the decided advantage gained through the exclusive ROTOCURE PROCESS.

P. S. If you're interested in transmission belting, look to BWH and ROTOCURE for all the above PLUS advantages! BWH transmission belts have a higher coefficient of friction because dusting agents are not required. RESULT: belt tensions are minimized and belt life is extended.

* "Overcured Sections." You won't find them in BWH Rotocured Process Belts. These critical sections are present every 30′ to 40′ in all belts made by the flat press process. Only Rotocuring eliminates this cause of belt failure.

DIAGRAMATIC SKETCH OF EXCLUSIVE ROTOCURE PROCESS



BWH — DEPENDABLE RUGGEDNESS

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

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Continued from page 25

Big problem confronting plywood mills right now is building up log inventories against prospective winter shutdowns in the woods. Scrambling for logs is very active; prices are holding fairly steady. Pressure on log supply shows some tendency to spur ingenuity of operators in utilizing logs heretofore considered below peeler size and grade.

Pulp and Paper

Demand and production continue very strong, but without significant change in price structure over 30 days ago. All mills in Oregon, Washington and British Columbia reported working 7-day week. Most producers, both pulp and paper, are selling their production on allotment basis. American producers are apparently trying to hold a stable market. Bleached sulphite, for example, about $150 per ton maximum. However, Swedes reported taking orders for as high as $210 per ton Atlantic Coast in U. S. money from distressed paper mills which are unable to fill out their needs from North American sources. Unlike Scandinavian exports of early '30's, foreign influence is now distinctly limited because of inadequate timber for long haul and heavy European orders.

No sign yet of West Coast mills being required to convert to military pulp production. Campaigns to strengthen long range supplies of farmer-produced pulpwood are being adopted. Some plant expansion seems to hinge on greater assurance of wood supply. Mills are keeping supply inventories up by prompt buying, but no indication of hoarding. Items manufactured from chrome, nickel, and some other special metals are increasingly hard to get.

Canning and Packing

With practically all figures in for the 1950 Alaska pack, the record shows one of the poorest years for more than a quarter century. Total for all districts, all species, ran 3,235,000 cases, roughly three-quarters of the 1949 pack. Preliminary reports indicate the British Columbia pack suffered less, was about on a par with 1949. Puget Sound pack, with still a little to go, was under 200,000 cases, as against 686,000 cases in 1949—a year of heavy pink run. Columbia River pack generally was off.

Prices are steady, but very high. Demand is strong. Some government buying. Pack should be better next year. Prices bound to be strong. Buying of equipment for next season has not started yet. Labor outlook uncertain, but pattern of past several years has been one of steady wage increases with tough last minute bargaining which has cut into operating seasons and raised costs seriously.

WHEAT FLOUR

In thousands of sacks
(From Bureau of the Census)

	Aug. 1949	Total 8 mos. 1949	Aug. 1950	Total 8 mos. 1950
Oregon-Washington	1,362	10,115	1,327	8,980
Montana	264	2,093	249	2,144
Utah	352	2,437	380	2,583
Colorado	401	2,985	398	2,502
California	412	2,897	449	3,099
TOTAL	2,791	20,527	2,803	19,298

Southern California tuna packers were shut down for several weeks by strikes which ended with wage increase of 10¢ an hour, and some classifications up to 20¢. Previous minimum has been $1.40 an hour for women, $1.55 for men. Operators on piece-rate basis get equivalent of 20¢ an hour raise. Three weeks vacation allowed after 10 years of employment. Shut-down allowed packers to work their stocks off. Southern California sardine catch heavy, far above Monterey and San Francisco.

Early rains cut California tomato pack considerably. California prune crop 155,000 tons, of which only about 3,000 tons substandard. Total crop about half sold, 20% export, 30% domestic. California Olive Advisory Board reports eastern markets have taken 57% of the pack so far this year, indicating ripe olives are going over in eastern market better than ever before. Usually the East only takes 45% to 50%. Canners stocks of California asparagus as of October 1, totaled 1,082,485 actual cases, 157,966 cases more than a year ago. Apricot stocks 1,942,305 cases, No. 2½ can basis, 277,366 cases less than last year. Cherries 301,347 cases, 50,111 cases below.

WEST COAST LUMBERMEN'S ASSOCIATION

(Thousands of board feet)

	September Aver. Per Wk. 1950	1950 39 Weeks M Feet	1949 39 Weeks M Feet
Production	234,330	7,878,654	7,277,897
% 1949-1949 Yrs.	142.8%	123.1%	113.7%
Orders	197,561	8,407,656	7,355,333
Shipments	231,614	8,015,320	7,196,159

CALIFORNIA REDWOOD ASSOCIATION

(Thousands of board feet)

	Aug. 1950	Aug. 1949	Total 8 mos. 1950	Total 8 mos. 1949
Production	57,594	48,561	408,236	344,877
Shipments	55,812	36,255	376,986	265,110
Orders Rec'd	56,060	40,377	399,300	265,658

	Sep. 1950	Sep. 1949	Total 9 mos. 1950	Total 9 mos. 1949
Production	53,167	46,112	470,354	390,989
Shipments	46,732	37,691	431,315	302,801
Orders Rec'd	54,734	55,151	459,847	310,809

WESTERN PINE ASSOCIATION

Comparative report, 99 identical mills, in thousands of board feet)

	Week Ending Oct. 28	Three Year Weekly Avge. for Oct.	Total to Date 1950	Total to Date 1949
Orders	63,269	63,391	3,215,553	2,758,767
Shipments	72,804	67,910	3,227,565	2,699,669
Production	72,121	70,790	2,851,332	2,535,951

PULPWOOD

(Pacific Northwest)

(Cords of 128 cu. ft., roughwood basis. Source: Bureau of Census)

	Aug. 1949	Aug. 1950	Total 8 mos. 1949	Total 8 mos. 1950
Receipts	362,568	465,040	2,045,794	2,031,578
Consumption	264,890	346,786	2,080,518	2,495,496

SOFT PLYWOOD

From Bureau of the Census

PRODUCTION

(in thousands of square feet)

	1949	1950	Total 8 mos. 1949	Total 8 mos. 1950
August	182,204	243,610	1,273,553	1,576,942

Apparel

Search for substitute fabric materials already has started in an effort to bypass kiting prices of the scarce fibers. With the world wool supply now at an all-time low and the armies of many nations yet to be uniformed, prices of wool fabrics already have bounced against the ceiling fixed by manufacturers' willingness to absorb such cost.

The trade is turning to blends of wool with cotton, rayon and other synthetics. The Canadian government has been testing wool-rayon fabrics for air force summer wear and finds it an ideal substitute for pure wool tropical worsted. Civilian clothing makers likewise are planning to make substitutions wherever possible.

Nylon supply so far has not been curtailed but the industry has had no word as to how much the military, particularly the Air Force will require. Prices of this "most sensitive fabric" dropped sharply when the Korean crisis seemed to level off, then began to climb again when the war outlook tightened. Now the trade is scheduling new nylon items for spring production, but fearfully, with an apprehensive eye on the world outlook. There is talk that hosiery makers are hoarding silk in fear that nylon again will become scarce as in World War II.

Western manufacturers have been holding off on future orders, hoping prices will settle down after the Korean buying spree. They cannot hold out indefinitely. The world wool supply is so tight that some say the fabric may eventually go the way of silk, pricing itself out of the market. Cotton fabrics have risen and the outlook is for a short cotton crop, leaving little hope for lower prices.

Meanwhile the new labor agreements have lifted the cost of production. Men's clothing workers are getting their pay boosted about $5 a week. Other factors probably will combine to lift retail prices next spring about $5 to $10 per suit. This again will add to the unmistakable consumer resistance now being felt to high prices.

CONFECTIONERY AND COMPETIVE CHOCOLATE PRODUCTS

From Bureau of Census
(In thousands of dollars)

% Change = Per Cent Change from same month of preceding year

1950	Colo. Idaho Utah Sales	% Chg.	Wash. Ore. Sales	% Chg.	Calif. Sales	% Chg.
Mar.	482	—20	619	+ 1	2344	—12
Apr.	424	—16	454	— 4	1916	— 7
May	375	— 6	472	+31	1719	+ 4
June	356	— 7	411	+22	2084	+11
July	276	+ 1	318	+16	1484	+ 6
Aug.	414	+22	524	+24	2176	+ 9

RYERSON STEELGRAMS

This bulletin is written to keep you abreast of the warehouse steel situation as we see it here at the Ryerson Company. We hope you will find this summary helpful in specifying, buying and working with steel.

If you have orders with DO Priority Ratings be sure to pass ratings along to your steel supplier. This will not only expedite delivery of steel but may also help warehouses maintain inventories against your future demands. Depleted warehouse stocks of 1942 emphasize importance of working for continuous replenishment.

New loan guarantees, recently announced by the Federal Reserve are helping many small manufacturers with defense contracts. Similar to World War II V-Loan program, the new set-up provides such manufacturers with easier access to working capital.

Despite restrictions on nickel, you will still be able to obtain alloy steel of comparable performance containing other alloying elements. As warehouse stocks of nickel alloys are depleted, triple alloys, which proved their worth in World War II, will take their place. Cost — slightly less.

A word about telephone service — A tremendous number of incoming calls is taxing the capacity of our personnel and switchboards, and even of whole exchanges that serve our plants. What we are doing about it: Improved facilities are now being installed or planned for where needed. Suggested emergency measures: early calls before peak loads; telegraph; mail, which most Ryerson plants pick up hourly at P. O. for quicker service.

Improved outlook — Building for the future, the Ryerson Chicago plant is being extensively rebuilt and enlarged. In Cincinnati — a completely new Ryerson plant at new location soon to be in operation. At Philadelphia — a new mill-type slitting line gives quick service on strip steel of any width up to 48".

New machinability records for alloy steel are being set by Ryerson Rycut — a free-machining medium-carbon alloy. Shop experience shows that Rycut machines 25% to 50% faster than standard alloys of same type, annealed or heat treated.

Shortages of some products such as bars, shapes, plates and sheets are inevitable. But many others are in good supply at Ryerson. Among them:

Tubing — Good tonnage of both seamless and welded mechanical tubing is on hand and new stock is coming in regularly. So while we may be short of a few sizes one week, they may be available the next.

Inland 4-Way Safety Plate — Large and medium patterns in a good range of sizes available for those who need material combining a sure-traction surface with strength, durability and fire-safety.

Also quickly available from Ryerson: Forgings, cold drawn special shapes, tool steel, drill rod, chain, wire rope, expanded metal, Babbitt metal.

Joseph T. Ryerson & Son, Inc. Steel-service plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles and San Francisco.

THE COMING MANPOWER SHORTAGE

. . . and what you can do about it

A NUMBER of good reasons contribute to the coming lack of manpower in the West.

There are fewer people of working age. Of those people, stepped-up industries (to serve abnormal postwar demands) have taken many. Defense plants are starting to accelerate production programs and expand plant facilities. Military requirements are abnormal to what was expected a few months ago. These factors, in large measure, are responsible for our dilemma.

1. *Our population of working age people is declining.*

For our purpose, we shall consider that a person reaches working age at 18 years. This is about an average for high school graduates, and also the age when a man must register for selective service.

A person who became 18 years old in 1950 was born in 1932, the year of lowest birth-rate in this country since 1926. Hence, this year, 1950, produced less persons of working age than any year since 1927. From 1928 until 1932 there was a practically steady drop in births in the United States. Then the figure started slowly upward. Not until 1937 did the birth-rate equal the birth-rate in 1928.

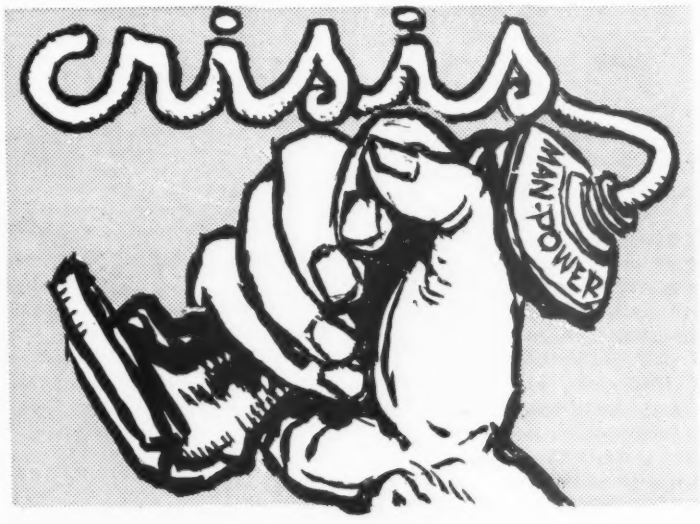
In other words, the number of persons per year reaching 18 years of age started becoming smaller and smaller in 1936. This number fluctuated a little, but it steadily declined until 1950. Now it has started upward again but it will not equal the 1936 crop of 18-year-olds until around 1954 or 1955.

There you have reason No. 1: there are not as many people in the labor force.

2. *Non-defense industries are absorbing labor like mad.*

Glenn E. Brockway, Regional Director for Region X (Washington, Oregon, California, Nevada, Arizona, Alaska and Hawaii) for the U. S. Bureau of Employment Security, has this to say about labor in his area:

"Normal civilian industries so predominant in the West, such as metal mining, aluminum manufacturing,



lumbering and logging, metal manufacturing, construction and transportation, all show very important employment increases considerably in excess of the usual seasonal upswing.

Civilian production has them...

"In fact, non-agricultural employment in Oregon, California and Washington are approaching a new peacetime high, with the impact of the Korean crisis on employment having a *greater effect indirectly than directly.*

"Retail and wholesale trade and durable and soft goods manufacturing have taken on substantially greater numbers of workers since Korea day, than have the direct military and defense mobilization establishments. The reasons appear to boil down to:

a. Need for additional services to handle the enroute or temporary stationed military personnel;
b. Additional demands created for services and manufactured goods resulting from new payrolls directly attributable to the Korean crisis employment;
c. Efforts by manufacturers, suppliers and builders prior to the taking effect of material controls, to get material, fabricate it, and acquire maximum inventories or complete construction;
d. Stimulation of credit buying, prior to application of credit controls and scare or hoarding buying (particularly during July and August).

"In addition, certain industries have established difficult competitive conditions wage-wise, through heavy overtime payments, to assure the completion of construction, or the use of maximum materials (some of it gray market), prior to the inevitable materials controls impact.

"Thus, in addition to absorbing large numbers of workers (non-defense), a competitive condition has been engineered which has not only retarded individuals from accepting defense employment, but actually caused new or old workers to leave their defense employment, in order to get the bigger paycheck for a period of time, assuming full well that they could return to defense employment without difficulty 'later on'."

Hence, you can readily deduce that the currently available supply of labor is being further drained in large measure for non-defense industries.

3. *Defense industries are stepping up their production and expansions at a terrific rate.*

Uncle Sam needs airplanes in huge quantities, and he needs them fast. He also needs tanks, bazookas, guns, and thousands of military items.

In the West there are nine types of defense mobilization activities:

1. *Airframe Manufacture* in:
   Los Angeles Area
   San Diego Area
   Seattle Area

Defense industry needs them...

2. *Aircraft Parts and Accessories Manufacture* in:
   Phoenix Area
   Tucson Area
   San Diego Area
   Los Angeles Area
   Seattle Area
   Tacoma Area
   Portland Area
3. *Aircraft Decocooning, Overhaul and Modification* in:
   Tucson Area
   Sacramento Area
   Los Angeles Area
   San Francisco Area
   San Diego Area
   Seattle Area
   Tacoma Area
4. *Fleet Component Demothballing, Overhaul and Repair* in:
   Los Angeles Area
   San Diego Area
   San Francisco Area
   Seattle Area
   Bremerton Area
   Portland-Vancouver Area
5. *Ammunition and Ordnance Depots* in:
   Northern Arizona (Navajo Ordnance)
   Reno Area (Hawthorne Naval Ammunition Depot and Sierra Ordnance Depot)
   Los Angeles Area (Several)
   San Diego Area (Several)
   San Francisco Area (Several)
   Sacramento Area (Several)
   Seattle-Bremerton Areas (Several)
   Tacoma Area (Several)
6. *Port of Embarkation and Supply Activities* in:
   San Diego Area
   Los Angeles Area
   San Francisco Area (Predominant)
   Seattle-Bremerton-Tacoma Areas (Predominant)
   Grays Harbor-Olympia Area (Predominant)
   Portland-Vancouver Area (Minor)
   Oregon Congressional Delegation has been making strong representations to Department of Defense for "change of pattern."
7. *Personnel Airlift Activities* in:
   Seattle-Tacoma Area (Predominant)
   San Francisco Area (Predominant)
   Sacramento Area (Predominant)
8. *Reactivated Airfields and Training Camps.*
   Practically every major airfield or training base that had been secured has been reactivated. Those previously in use have had activity stepped up to the maximum.
9. *Atomic and Guided Missile Manufacture* in:
   Washington
   Arizona
   California.

These major activities are specifically pointed up because they represent a military mobilization overlay, on top of the West's economy as it existed prior to Korea Day.

Of these activities, aircraft decocooning, overhaul and modification, fleet component demothballing, overhaul and repair, and atomic guided missile manufacturing are completely new since Korea Day. All the other six activities have seen major increases.

Airframe manufacture, and aircraft parts and accessories manufacture, are suddenly spurting ahead to the tune of

Uncle Sam is taking them.

many millions of dollars and an increase in the labor force of many thousands of persons. Aircraft manufacturers are right now back east, recruiting skilled help for California.

Without exception, shortages exist in the following occupations in all of the defense mobilization areas in the West:

Machinists (general and specialized)
Mechanical Engineers
Aeronautical Engineers
Electrical Engineers
Tool Designers
Jig Builders
Experimental Bench Mechanics
Metal Hand Formers
Mock-up Men
Rework and Modification Field Mechanics
Aircraft Propeller Repairmen

Employer specifications will have to be less prohibitive.

Electronic Repairmen
Radar Repairmen
Radio Repairmen
Communications Installers and Repairmen
Electricians
Shipfitters
Sheet Metal Workers
Stenographers
Auto Mechanics

In several areas, bricklayers, plasterers, tile setters, roofers and carpenters are unavailable to meet major construction requirements.

Note that among the nine types of activity listed above, ship construction was not included, although there was heavy emphasis on that operation in the West during World War II. Very little ship construction is under way in the West at this time. *Any* development in this regard which would require skilled and unskilled workers would have very serious labor supply consequences.

4. *Military personnel is increasing by leaps and bounds.*

We are committed to a military force of 3,000,000 men. Since that figure was announced, things have been happening on an international scale which would seem to indicate that this figure could be taken as a minimum requirement.

In order to maintain a force of that size, there is a consistent yearly demand for 750,000 replacements. These replacements will probably be, for the most part, men just turned military age. Out of the annual crop of men of that age, just about 750,000 of them will be available for military service, after physical examinations have eliminated the balance.

Hence, the crop of younger workers is practically eliminated from our labor pool; productive workers between 18 and 26 will be extremely hard to find; and if Congress decides that they want to draft veterans, the next layer of manpower above age 26 will be vulnerable.

Since last summer, many things have happened which are having significant effect on our national economy and on many of us as individuals. (Whether we are at war with another nation or whether the Korean incident is one of police activity is not important.) We are committed for an indefinite time to expansion and supply of our armed forces for our own protection, and for the cooperative protection of democratic ideals throughout the world.

Through late 1948 and 1949 we had a fairly high level of unemployment nationally. In some areas it reached serious proportions. But unemployment started a downward trend to a significant degree during the spring months, this year, prior to the Korean incident.

Nationally, the nearly 4.5 million unemployed last February was reduced to 1.9 million by October. (By comparison, in 1940 we had 7.8 million unemployed.)

For the states of Washington, Oregon and California, the February level of 691,000 unemployed plunged to 350,000 just prior to the Korean incident. And from "K" day to October 20, it sank still further down to 200,000. That drop was sharper than for the country as a whole.

And for the West it is important to note that there is no reservoir, although some winter relief is in sight, because of normal work shutdowns in the Northwest for the season. Cutbacks in housing programs, and in occupations using critical materials like aluminum may also have some effect.

The decrease in unemployment noted from February to October is due to civilian production increase, not war needs. Next spring, the Armed Forces announce, they will draft 1.9 million men. They will be hit hard to procure even the 3,000,000 proposed total. But they come first: industry comes second.

"Men between the ages of 18 and 26 are the hardened steel on the cutting edge of our combat troops sword," says Colonel William Hart, general personnel supervisor for Crown-Zellerbach Corp. and in command of the Bay Area reserve Selective Service training unit. (On pages 44 and 45 in *Western Industry* for September, Col. Hart offers a more complete discussion of industry vs. military manpower requirements.)

All this comes down to the main point: Who is going to work in your plant? From where is the "Vanishing American" going to appear? How are you going to keep your plant producing, in light of these manpower requirements?

Look first at the potential labor supply, and see what is left.

1. *Unskilled labor.*

Unskilled labor has generally been in adequate supply. However, increased employment requirements could, in the Seattle, San Francisco,

In-plant training will help.

Reno and Phoenix areas set under way inter-area recruitment demands for unskilled workers.

2. *Women.*

The supply of *older* women is good. Such is not the case with *younger* women. Lately the birth-rate has been going up again, and a large portion of the pool of younger women consists of mothers who have children to care for, which was not the case in the last war. In 1950 there are many more women with families than in 1944.

Women cannot do many of the operations in plants now that were done during the last war (particularly in airframe manufacturing plants). Today's aircraft is much heavier and bigger, and it is an electrical power plant as contrasted to World War II aircraft.

3. *Older workers.*

Employer specifications are to date, as a general rule, prohibitive as far as age requirements are concerned. Most employers are even more rigid in this specific requirement as far as women are concerned.

However, when the pressure really comes on, it is a reasonable bet that the oldsters will be blotted up somewhat by the mobilization group, and to a great extent by the essential activity and supporting services group.

4. *Minority workers and non-citizens.*

Here again, employer hiring practices and selection gymnastics are generally setting aside this valuable pool until all the stops are pulled. This group will probably be used, when the production worker base is broadened, before oldsters and women.

5. *Draft age workers.*

This group does not constitute a "supply resource" to the same extent the older worker, women workers, and minority group workers do. Hardly any in this group is now "unemployed." Even so, defense plant employers are reluctant to gamble on them, even though the Selective Service System is rejecting a high proportion of those called up. This may be short-sighted policy for employers, because they may likely be in dire need of these very men when released from service. If they are chemists, engineers, or other trained specialists, the immediate years after the present emergency may find the country with a considerable shortage of such people.

There has also been a pattern established of "avoiding" reserves and national guardsmen and of obviously trying to "save" reservists from active duty.

Obviously, the reservist's active duty can only be temporarily delayed; the national guardsman's, not at all.

To quote Colonel Hart again, "For long range forecasting, in event of full mobilization, plans must be based on the loss of all physically acceptable men below 26, and most of all under 36."

There you have it. You know the demand and you know the supply. They are a long way from meeting. Something must be done to stimulate a supply of manpower. What?

Three courses of action are offered:

1. Drain present supply sources;
2. Concurrently, institute training programs;
3. Legislate controls.

Of these, the first course is a foregone conclusion. It is under way now. The second course is obviously necessary, and is now under way in some respects. When firms like Garrett Corporation's division, AiResearch Manufacturing Co., find that only about three persons are hired out of every 100 job applicants, the importance of this issue is obvious.

Aircraft Industries Association, Los Angeles, informs *Western Industry* that "Convair, Lockheed and Douglas at Long Beach already have started training programs in public schools. North American is just beginning to start in-plant training courses at its Los Angeles plant."

Selective Service Classifications

	Class I
Class I-A	Available for military service.
Class I-A-O	Conscientious objector available for non-combatant service only.
Class I-C	Member of the Armed Forces of the United States, the Coast Guard, the Coast and Geodetic Survey or the Public Health Service, and certain registrants separated therefrom.
Class I-D	Member of Reserve Component or student taking military training.
	Class II
Class II-A	Deferred because of civilian employment (except agriculture).
Class II-C	Deferred because of employment in agriculture.
	Class III
Class III-A	Deferred because of dependents.
	Class IV
Class IV-A	Registrant who has completed service; sole surviving son.
Class IV-B	Official deferred by law.
Class IV-C	Aliens.
Class IV-D	Minister of Religion or Divinity Student.
Class IV-E	Conscientious objector opposed to both combatant and noncombatant military service.
Class IV-F	Physically, mentally or morally unfit.
	Class V
Class V-A	Registrant over the age of liability for military service.

Other industries are no doubt along the way of putting training programs into action. A definite trend is beginning to evolve, particularly in the aircraft field. Training programs, aimed at the electronics, radar, radio, communications, aircraft mechanics and rework and modification field mechanics, as well as other skills essential to the machine and metal trades must be put into immediate action. During the last war, the military services did an excellent job of technical training in short order. Private industry might do well to study military methods in this regard.

Two actions are envisaged by Glenn Brockway:

1. Providing of authority and a plan to the Western Region, which will assure that such workers in these critical occupations can be identified, procured from Western Region non-defense establishments and transferred to defense establishments.

   This would involve among other things, the application of critical occupation ceilings to non-defense employers, and the establishment of critical occupation ceilings and priorities on defense employers;
2. Providing of authority and a plan to other Regions, which will permit the same actions to be taken with respect to specific employers in their Regions, to supplement and backstop where and when necessary the actions taken by the Western Region.

It is recognized that more than reluctance will meet this recommendation. It means embarking on the road to controls and the bleeding of non-defense industries such as television, radio, jewelry, electrical appliances, etc.

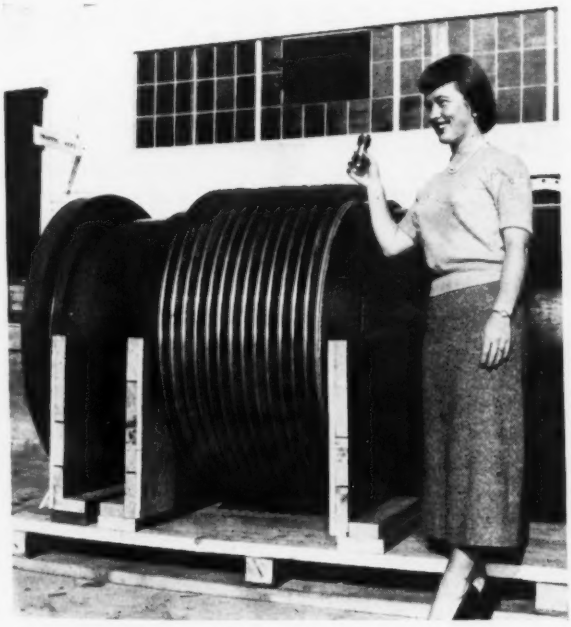
But this recommendation is designed to produce directly and quickly the needed skills, by transfer, which transfers otherwise may ultimately come about, indirectly and belatedly.

Our first job is to win the peace. To do this, we must do first things first. Our main objective in the West these days is to get the right kinds of workers, with the needed skills and in the right numbers, to the defense employers first, and to essential and civilian employers and services next. Any plans which will do this are all we need. But we need such plans now.

For latest information on Western labor problem recommendations, see page 52.

WESTERN PROCESSES AND PRODUCTS in Today's View

70 MILES FROM SEATTLE, WASH., is the scene at the White River Tree Farm of Weyerhaeuser Timber Co., where this 212-foot Douglas fir trunk grew. It became the tallest Xmas tree in the world, in Seattle, with 3500 lights on it.



SAN DIEGO, CALIF.—That little thing (in the girl's hand) is an aircraft bellows, made by Solar Aircraft. The big thing is an expansion joint such as Solar is now turning out for industries in the West.

MUROC, CALIF.—The hottest thing that flies, Lockheed F-94, has just completed six months test of wartime flying jammed into one month's time. This, the newest all-weather jet fighter, is currently in production.

SPOKANE, WASH.—Included in that piece of aluminum is the one-billionth pound produced by Kaiser Aluminum & Chemical Corp. at the Mead reduction plant. Kaiser's production is now being stepped up 16%.

AIRCRAFT MAINTENANCE: Problems of a

THERE are no books entitled "How To Operate A Feeder Air Line," nor much of any other outside information on the subject available.

Consequently the signs "Quiet Please—Minds At Work," placed at convenient locations in the maintenance department of Empire Air Lines at Boise, Idaho, are highly appropriate.

Versatility Required

Other branches of air transportation have been active for the last 25 years, have established procedures applying to the majority of their maintenance problems, the experience of others is available to them and the original flying equipment is specifically designed for their use. Feeder air lines, on the other hand, are required to service communities and towns which often do not have adequate airport facilities, and the original design of approved aircraft does not meet the needs of this type of air service. Consequently, each feeder air line must rely on its own mental resources to work out its particular problems.

This means that the equipment has to be suitably modified, the maintenance crews must be unusually versatile and the maintenance program must be set up so that the ships will be out of service for a much shorter period than is customary with the major air lines. The key to the last problem, as developed by Empire Air Lines, is a progressive overhaul chart showing the date for overhaul of each individual part of each aircraft.

More Time Between Overhauls

The Civilian Aeronautics Administration has recognized that past experience in operating aircraft with minimum structural failures has proved

that a successful operation can be carried on with proper supervision by the maintenance crews. As a result, Empire has received an extension of time before which engines must be given major overhaul from 150 to 1050 hours, on propellers from 1500 to 2100 hours, and on the aircraft from 5500 to 8000 hours. Inspection, repair and overhaul schedules as required by CAA include a daily, 60-hour and 180-hour inspection and the results are reported to CAA.

This Is Teamwork

Through the progressive overhaul system and the team work of pilots, mechanics and others, we at Empire Air Lines have been able to qualify the fourth consecutive year for the National Safety Award for not having an accident of any kind to the passengers we carry nor to any crew member.

Empire is authorized by CAA as an Approved Repair Station to do major overhaul of its planes as well as make some minor changes in the design with CAA approval. Two small crews of maintenance mechanics keep three planes on schedule flights each day, with one in reserve. They do the major overhauls, with the help of a couple of men to do the cleaning.

FEEDER air lines are the "country cousins" of the highly-advertised majors, such as United, TWA, Western, American, Pan-Am., and so on.

Although the major lines are sometimes known to look down their noses at the little feeders, and not to be too much interested in telling their passengers about opportunities to make all-air journeys, the feeders are doing a vitally important job for air transportation.

They enable small town merchants to display the latest goods in a hurry, to reduce the amount of stock they have to carry, and to avoid the necessity of stocking many slow-moving items.

They enable salesmen to visit towns they would otherwise have to skip.

They enable industrialists whose plants are located on their routes to speed up their movements, to get parts and supplies in a hurry and to reduce inventories of such items.

In short, they take the "ice" out of "isolation."

By using a progressive repair system and our own maintenance crews, Empire has cut the unserviceable time of aircraft to a fraction of the time generally consumed in major overhauls. For instance, most trunk lines remove their airplanes at specified times for an overhaul that may keep the ship out of service as long as 30 days. Our planes are back in service at the end of eight to twelve days, and we believe we maintain a closer inspection.

This Is the Team

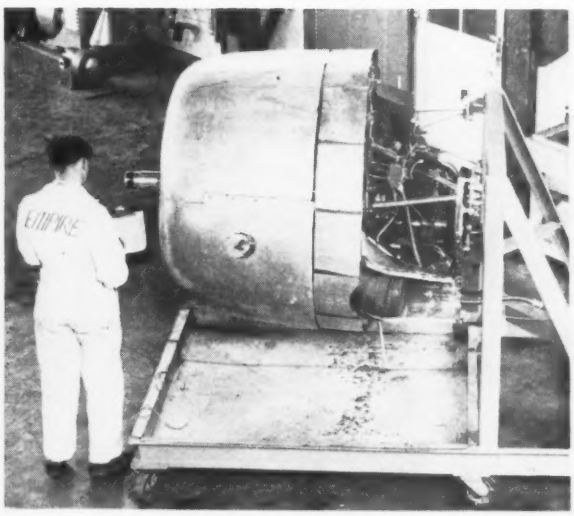
First of all, we pick our mechanics for their versatility. They are selected on a competitive basis, as their services require a knowledge beyond the average mechanic's education. Each man must have a knowledge of engineering, materials, specifications of the original design of the aircraft, CAA manuals, manufacturers changes, and be of a creative mind. Our men are required to inspect, repair and maintain the major parts of the aircraft engine, but they are not specialists on any one part or assembly.

They are all licensed A&E mechanics and must be able to perform the following types of jobs with skill and economy: engine build-up, engine

"Country Cousin"

By R. H. BENDIO
Superintendent of Maintenance
Empire Air Lines
Boise, Idaho

Putting planes back in service after only eight days keeps mechanics hopping. Above, the engine build-up shop.



Inspecting completely built-up power plant, crew chief fills out progressive overhaul chart shown on next page.

R. H. BENDIO, author, is Superintendent of Maintenance for Empire Air Lines.

changes, trouble shooting, hydraulics, rigging, sheet metal, welding, paint, dope and fabric work, propellers, instruments, electricity and radio. They must also be able to run-up, check out and taxi the plane to the terminal building prior to scheduled flights. The above requirements do not permit the use of apprentice mechanics in any crew. Obviously, each mechanic must be able to stand on his own two feet and handle any situation that comes up on his tour of duty, if the ships are to be in airworthy condition at all times.

Maintenance: No Red Tags

Maintenance is one of our main problems, and it takes new ideas and minds to reduce this to a minimum. For example, inventories must be maintained with an eye to the future, as parts cannot be substituted or manufactured by the crew in some cases. Unless careful study is given the inventory, the shortage of a part costing 10c may be the cause of "red tagging" the aircraft as unserviceable.

A complete history of the aircraft and engine is maintained from the first hour of operation. Keeping account of all operating parts is required in support of the CAA Airworthiness Certificate and in determining the inspection periods and the replacing of parts and accessories which have completed their allotted running time.

Overhaul time of the engine, the aircraft itself and the other operating units seldom are due at the same time. Consequently, records are checked prior to the engine overhaul time to determine the need for replacing the carburetor, generator, starter, supply pumps and other accessories. If the time on these accessories is not up, they can remain in service.

Chart is the Key

In order to keep the records with limited personnel, it was necessary to design and put in operation a chart which would serve as a key to the due dates of overhauls. As the total time on each airplane differs as much as 300 hours, the due dates allow sufficient time to plan the date on which the plane will be taken out of service. If some assemblies or units can be overhauled at a convenient time, before the major overhaul, duplication of work is avoided, the man hours are decreased and the time the plane is out of service decreased. By use of the chart, the Maintenance Chief can plan an engine overhaul and a small unit airframe overhaul at the same time without having two serviceable periods.

Engines are removed after 1,050 hours and replaced by a new conditioned engine, furnished on a contract at a saving over the cost of maintaining equipment necessary for complete major overhauls. The cost of exchanging engines is amortized over the 950 hour operating period and amounts to approximately $2 an hour. Propellers are removed after 1,900 hours and returned to an approved repair station for overhaul. Carburetors, generators, starters, pumps and instruments also are overhauled by certificated repair stations. Some accessories may see service on two engines, because their running time is twice that of the engine itself.

Some maintenance is necessary on the landing gear before the 3,750-hour overhaul time. Generally wheels and brakes are removed several times before the main gear overhaul. Bearings, bolts, nuts and small parts can be replaced by the crew, but the main gear parts and shock struts require special service and tools, so the job is done at the time of major overhaul. The original brakes on our DC-3's required six man hours on each daily inspection to maintain them in first class shape, but recently they were replaced by the new Goodrich expander tube brake which eliminated nearly all of this service and showed a minimum of wear after 600 hours of maintenance-free operation.

Where Wear?

Tires are good for around 450 hours, allowing 2.4 landings and takeoffs per hour. As soon as the tires show wear to the point where the tread is worn smooth, they are removed and recapped. The average tire can be recapped two or three times before discarding. While the wheels are off for changing tires, the hydraulic system is checked and worn parts replaced. Other repairs to the landing gear are made at the time of inspection, regardless of the number of hours on the gear record.

Radio systems are removed for complete overhaul and inspection. All electrical wiring for lights and remote control units are maintained by the radio and electrical department. The regular inspections and overhauls are completed at the same time that the aircraft and engines are being worked on.

Removal of the wings, stabilizers and control surfaces allows access to the complete operating units and controls. Interiors of the wings, fuselage and stabilizers are carefully inspected for cracked fittings or parts which show any indication of fatigue. Rivets and assembling bolts are inspected for looseness, elongation or any sign of unusual strain or movement, and wing and other assembly attaching bolts are

Concluded on page 53

PROGRESSIVE OVERHAUL CHART*

The key to a fast but complete overhaul system

	PLANE # N 62376			PLANE # N 62375			
	First Major Inspection	Inspection and overhaul completed	Next Major Inspection and overhaul due	First Major Inspection	Inspection and overhaul completed	Next Major Inspection and overhaul due	Fir Ins
Wing removal, Attach angle and Doubler inspection.	1852:06	5749:46	9749:46	2528:55	5748:47	9748:47	
Wing tips removed, repaired and reinstalled.		5749:46	12249:46		5748:47	12248:47	
Stabilizers removed, repaired and reinstalled.		5749:46	12249:46		5748:47	12248:47	
Vertical fin removed, repaired and reinstalled.		5749:46	12249:46		5748:47	12248:47	
Elevator, rudder control and trim tab cables removed and reinstalled.		5749:46	12249:46		5748:47	12248:47	
Wing flaps overhauled.	1865:14	5749:46	12249:46		5144:19	11644:19	
Fuselage renovated, repaired and painted.	1865:14	5749:46	12249:46		2628:46	9128:46	
Fuselage section, station 596 - attach angle bolts inspected and retorqued.		5749:46	9749:46		5748:47	9748:47	
Center section to fuselage attach angle bolts inspected and retorqued.	4435:30	5749:46	9749:46		5748:47	9748:47	

**Figures indicate number of flight hours.*

Second in a Series on Water Problems

The Industrial Quality Of Pacific Coast Waters

WATER COST is not just the cost of raw water, the first installment of this series pointed out in the November issue. After raw water is delivered into the plant, various other costs must be charged up to it, such as replacements resulting from corrosion, cost of descaling boilers, replacing boiler tubes, etc.

Failure to study the quality of the water thoroughly before selecting a plant site may result in water treatment problems that outweigh some of the more commonly considered factors. Hardness and alkalinity are two outstanding characteristics of water

By RAY W. HAWKSLEY
Chemical Engineer

that affect costs. The article continues as follows:

Chlorides are always shown on a water analysis. If this value is excessive, the water will be corrosive. In certain localities, the chlorides in the water supply become of significance as an indication of leakage of sea water into areas which are being overpumped, with consequent dropping of the water table. A steady rise of chlorides over a period of time has resulted from over-pumping in certain areas in California.

Sulfates are in most instances found in combination with calcium, although if any great amount of alkalinity is found present in the sample, a portion of the sulfates will be in combination with sodium. Calcium sulfate is usually found when boiler scale is analyzed, proving that this material is undesirable if present in the feedwater. It is not usual, however, to find very high values for sulfate in Western waters.

Formerly, determinations of silica were not ordinarily made on water

Silica scale in boilers means trouble. This cold lime soda softener at a California plant effectively removes the silica.
Illustration courtesy A. C. Lo Prest Co., San Francisco.

Important Characteristics of Water Sources In California, Oregon and Washington Cities

Tabulation of water supply facts, started last month, is completed below

CALIFORNIA (Continued)

Location	Key	Supply	Date of Analysis	Anal. Ref.	Tot. Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Chloride as Cl	Sulfate as SO_4	Silica as SiO_2
Menlo Park	BE	"	1940	2	90	108	10	54	—
Merced	BE	"	1940	2	72—96	104—112	11—17	6—13	—
Modesto	BEH	"	1940	2	58—112	92—140	19—244	0—12	—
Modesto	DFGH	Well	1950	3	460	96	598	12	53
Modesto	CFGH	City	1950	3	174	120	148	12	66
Monrovia	CF	"	1940	2	150—175	160—184	11—12	19—27	—
Montebello	DFH	"	1940	2	197—210	168—225	22—182	33—62	—
Monterey	CFGH	"	1948	3	136	130	23	56	26
Monterey Park	DF	"	1940	2	177—215	168—211	35—73	50—82	—
Moorpark	DFH	"	1940	2	397	184	140	277	—
Morgan Hill	DFH	"	1940	2	197—327	164—300	13—18	6—8	—
Mountain View	DFH	"	1940	2	217—313	248—276	23—34	31—92	—
Napa	A	"	1940	2	22	48	10	2	—
National City	CF	"	1940	2	124	160	74	38	—
Needles	DFH	"	1940	2	363	196	196	352	—
Nevada City	A	"	1940	2	50	24	5	12	—
Newman	DFH	"	1940	2	257—283	176—212	60—109	85—92	—
Newport Beach	BEH	"	1940	2	83	172	22	19	—
Niles	DFH	"	1940	2	343	316	58	31	—
Niles	BFGH	Well	1947	3	116	188	54	28	25
Norwalk	CF	City	1940	2	163	168	17	35	—
Oakdale	BE	"	1940	2	37—111	44—84	5—9	2—8	—
Oakland	BE	"	1931	1	30—102	10—18	7—12	8—18	5—17
Oceanside	CH	"	1940	2	167	208	124	15	—
Oildale	BE	"	1940	2	90—163	68—124	16—54	13—58	—
Ojai	DFH	"	1940	2	325	184	40	152	—
Ontario	CF	"	1940	2	143—183	144—160	10—13	2—35	—
Orange	CF	"	1940	2	167	172	48	77	—
Orland	CF	"	1940	2	169	144	35	10	—
Oroville	A	"	1940	2	20	22	2	8	—
Oxnard	DFH	"	1940	2	559	224	70	511	—
Palm Springs	BE	"	1940	2	30—120	45—110	7	5—14	—
Palo Alto	DF	"	1940	2	170—310	212—232	36—98	17—42	—
Pasadena	CFGH	"	1930	1	111—169	108—227	14—17	14—31	28—33
Paso Robles	DF	"	1930	2	310	236	46	58	—
Patterson	BEH	"	1930	2	117	112	152	134	—
Petaluma	CF	"	1930	2	104—140	132—172	18—46	0—17	—
Pittsburg	DFH	"	1930	2	230	120	180	173	—
Placerville	A	"	1930	2	24	12	5	2	—
Pleasanton	CH	"	1930	2	117—236	176—260	24—88	19—31	—
Pomona	BE	"	1930	2	83—117	108—136	8—13	21—42	—
Porterville	BE	"	1930	2	95—154	96—156	10—29	6—46	—
Red Bluff	BE	"	1930	2	87	136	11	10	—
Redding	A	"	1930	2	47	68	19	9	—
Redlands	CF	"	1930	2	122—159	116—160	10—17	27—37	—
Redondo Beach	DF	"	1930	2	160—200	204—244	63—88	12—46	—
Reedley	BE	"	1930	2	95	108	14	4	—
Richmond	BE	"	1931	1	30—102	10—18	7—12	8—18	5—17
Rio Vista	AH	"	1930	2	27	264	49	27	—
Ripon	BE	"	1930	2	110	128—140	23—24	25—33	—
Riverbank	BE	"	1930	2	67	88	13	8	—
Riverside	CF	"	1930	2	92—156	100—189	9—28	16—46	—
Roseville	A	"	1930	2	10	21	3	0	—
Sacramento	A	"	1948	3	12	62	1	16	2
St. Helena	BE	"	1930	2	70	92	8	15	—
Salinas	DF	"	1930	2	139—269	140—172	80—130	12—106	—
San Bernardino	DFH	"	1926	1	81—307	132—218	8—168	13—168	2—19
San Diego	CF	"	1930	2	124—132	111—195	27—57	14—24	—
San Fernando	CF	"	1930	2	164	200	20	77	—
San Francisco	A	"	1930	2	22—91	20—82	5—13	10—16	8
Sanger	A	"	1930	2	32—42	52—56	5—6	0—10	—
San Jose	DFGH	"	1949	3	240	242	15	12	26
San Luis Obispo	DFH	"	1930	2	310—655	294—460	22—350	12—250	—
San Mateo	BEH	"	1930	2	101—108	36—228	287—310	22—23	—
San Rafael	BE	"	1930	2	68—82	20—64	11—13	10—27	—
Santa Ana	CF	"	1930	2	155—189	184—212	48—52	54—69	—
Santa Barbara	CFH	"	1930	2	132—240	60—68	6—36	268—351	—
Santa Clara	CF	"	1930	2	137	172	17	42	—
Santa Clara	DFGH	Well	1950	3	236	182	17	100	24
Santa Cruz	BE	City	1930	2	115	120	15	38	—
Santa Maria	DH	"	1930	2	58—367	48—188	20—61	25—146	—
Santa Paula	DH	"	1930	2	316—514	192—296	35—53	203—374	—
Santa Rosa	CF	"	1930	2	125	108	14	15	—
Selma	A	"	1950	3	30	48	18	4	1
Selma	CFGH	Well	1950	3	154	194	31	6	59
Sierra Madre	CF	City	1930	2	123	156	19	27	—
Signal Hill	BEH	"	1930	2	63	156	27	0	—
Sonora	A	"	1930	2	15	32	5	0	—
South Gate	DF	"	1930	2	163—273	200—208	65—88	76—98	—
South Pasadena	CF	"	1930	2	138—245	100—182	18—81	21—45	—
South San Francisco	DF	"	1930	2	183—250	124—240	70—124	50—65	—
Stockton	CFGH	"	1949	3	120	166	130	16	65
Sunnyvale	CF	"	1930	2	123—228	228—240	25—26	35—46	—
Susanville	BE	"	1930	2	84	92	5	0	—
Taft	BE	"	1930	2	38—84	76—104	5—20	3—37	—
Torrance	CF	"	1930	2	137—150	200—256	66—68	3—4	—
Tracy	CF	"	1930	2	130—197	120—140	58—67	77—116	—
Tulare	A	"	1930	2	45	72	8	10	—
Turlock	CF	"	1930	2	103—230	76—232	9—59	4—31	—
Tustin	AH	"	1930	2	47	136	30	42	—
Ukiah	BE	"	1930	2	78	92	9	17	—
Upland	DF	"	1930	2	163—210	144—180	7—13	12—50	—
Vallejo	CH	"	1930	2	16—187	9—116	10	45	12—120
Ventura	CH	"	1930	2	145	72	36	312	—

What the Headings Indicate

ANALYSIS REFERENCE

1—The Industrial Utility of Public Water Supplies in the United States, 1932. Geological Survey Water-Supply Paper 658.

2—California Water Supply Statistics, 1940. Department of Public Health, State of California.

3—Independent laboratory results from various sources.

EXPLANATION OF KEY

A—Soft water, suitable for boiler feedwater with internal treatment chemicals alone.

B—Moderately hard water, can be used for boiler feedwater with internal treatment chemicals only, but presoftening should be considered for economy.

C—Hard water. Excessive amounts of internal treatment chemicals required for boiler feedwater. Presoftening almost mandatory.

D—Very hard water. Presoftening must be used.

E—Suitable for zeolite softening.

F—Hot lime soda softening should be considered for boiler feedwater, and may be more efficient than zeolite softening.

G—Silica above desirable value. May be a problem in boilers.

H—Special study recommended.

samples. However, this value is of the utmost importance if the water under study is to be used as boiler feedwater. Silica can under certain conditions give rise to a very hard dense scale which is almost impossible to remove. In certain cases the only remedy for a heavy deposit of this type of scale is retubing of the boiler.

It is unfortunately true that the whole West Coast is subject to higher proportions of this troublesome element than other general areas of the United States; and a determination of silica should be insisted upon in any water analysis under consideration. If more than 15 parts per million of silica are shown on the analysis, silica scale is a possible operating problem, especially in higher pressure boilers.

Removing Silica

Silica may be removed from water supplies in various ways. If a hot lime soda softener is in use, almost complete removal of silica can be achieved, by the use of dolomitic lime or the addition of activated magnesium oxide. In some cases there is enough natural magnesium present in the water to give good results.

A lesser degree of silica removal can be accomplished with a cold lime soda softener. Exchange resins have been developed which will remove silica very efficiently, in the cold. If silica is not removed from the feedwater in any

of these ways, the formation of silica scale in the boiler can be prevented by careful regulation of the alkalinity values in the boiler water and proper blowdown practice.

Removing Iron

Determination of iron is usually made on water supplies, and becomes of great importance in numerous special applications. Where color is a consideration, as in paper manufacture, iron is very objectionable. In domestic water supplies the presence of iron is shown by staining of porcelain fixtures, or by "red water." If more than a few parts per million of iron are present in a water supply, a discoloration of water which has been allowed to stand in contact with air, will be observed. Iron is not particularly significant in boiler feedwater.

Iron may be removed completely by the use of special exchange resins, and where this element is undesirable, total correction of an iron condition can be achieved by this means.

Hardness Problems

Speaking generally, natural waters found in the West are apt to be high in hardness, with the hardness mostly in the form of "temporary hardness." Alkalinities are high, and silica values high. These facts give rise to various problems in the industrial use of water in this area. Corrective measures are available, and where water analyses suggest the possibility of trouble, management should give study to treatment of the water supply to achieve most economical results. Even in industrial plants which have been long established, it is quite often possible to make decided improvements in maintenance costs through a careful study of water use and water treatment.

In the water analyses which are appended, an attempt has been made to give a comprehensive view of Pacific Coast waters through tabulating typical water analyses from a number of locations in California, Oregon, and Washington. The source of the analyses has been given, with the date of analysis.

For purposes of general estimation, the values given are of the right order of magnitude, since water supply characteristics do not usually change materially even over fairly long periods of time. However, it should be borne in mind that there may be considerable *seasonable* variation of water characteristics throughout the year, and in all cases where exact conclusions are to be made, special analyses should be secured.

CALIFORNIA (Continued)

Location	Key	Supply	Date of Analysis	Anal. Ref.	Tot. Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Chloride as Cl	Sulfate as SO_4	Silica as SiO_2
Vernon	DFH	"	1930	2	203—407	192—260	27—129	100—170	—
Visalia	BE	"	1930	2	92—113	104—124	11—17	13—21	—
Watsonville	DF	"	1930	2	197—230	188—314	17—39	34—50	—
Whittier	CF	"	1930	2	117—166	140—192	7—12	29—49	—
Willow Brook	DF	"	1930	2	190	180	26	92	—
Willows	DF	"	1930	2	167—243	224—256	19—69	13—58	—
Woodland	DF	"	1930	2	244—329	228—276	52—85	10—31	—
Yreka	DF	"	1930	2	264—386	204—276	6—12	10—17	—
Yuba City	BE	"	1930	2	32—105	136—140	28	0—4	—

OREGON

Location	Key	Supply	Date of Analysis	Anal. Ref.	Tot. Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Chloride as Cl	Sulfate as SO_4	Silica as SiO_2
Albany	AG	River	1944	3	27	21	2	—	15
Arlington	BE	"	1945	3	86	86	10	—	—
Ashland	AG	Creek	1945	3	27	43	1	—	20
Astoria	AG	City	1932	1	25	30	7	4	26
Baker	BE	"	1938	3	53	58	1	—	9
Bandon	A	"	1948	3	9	10	19	0	12
Beaverton	CGH	Well	1945	3	157	142	93	5	47
Bend	A	Creek	1945	3	12	17	2	—	2
Burns	AGH	City	1945	3	58	87	8	—	94
Central Point	DFGH	Well	1945	3	190	149	106	19	48
Coos Bay	AG	City	1944	3	39	26	15	—	18
Corvallis	AGH	"	1945	3	31	31	—	—	24
Coquille	AG	"	1945	3	27	27	13	—	15
Cottage Grove	A	"	1941	3	29	43	6	—	—
Dallas	AGH	"	1945	3	20	20	4	—	32
Eugene	AG	"	1943	3	17	27	1	—	17
Forest Grove	AGH	Creek	1945	3	36	48	3	—	26
Grants Pass	AGH	City	1945	3	44	43	5	33	30
Heppner	BGH	"	1945	3	62	103	1	—	53
Klamath Falls	BGH	"	1930	1	41	117	8	0	46
Marshfield	A	"	1931	1	38	24	14	18	10
Medford	AGH	"	1925	1	28	21	4	6	28
Monmouth	AGH	"	1945	3	19	27	4	—	24
Mt. Angel	BGH	"	1943	3	113	130	16	7	47
Myrtle Point	AGH	"	1945	3	46	46	10	—	40
Newberg	AGH	"	1945	3	43	50	5	—	48
Newport	A	"	1945	3	10	15	16	—	10
Nyssa	CFGH	Wells	1946	3	171	231	32	70	45
Oakridge	A	City	1945	3	22	24	2	—	15
Ontario	CF	"	1946	3	171	137	28	—	14
Oregon City	AGH	"	1945	3	21	15	4	—	49
Oswego	CFGH	"	1949	3	126	154	5	10	50
Pendleton	AGH	"	1942	3	39	44	3	—	38
Pendleton	BFGH	Well	1949	3	121	149	10	10	50
Portland	A	Creek	1945	3	10	12	1	1	—
Prineville	BGH	City	1945	3	94	157	15	—	79
Redmond	AG	"	1945	3	21	29	4	—	20
Reedsport	A	"	1944	3	21	14	43	—	10
Roseburg	A	"	1949	3	45	33	11	12	12
Salem	A	"	1944	3	19	27	3	5	14
Seaside	A	"	1946	3	10	9	4	—	1
Silverton	AG	"	1945	3	15	22	2	—	19
Sisters	AGH	"	1945	3	19	27	2	—	21
Springfield	AGH	"	1948	3	15	31	2	—	22
St. Helens	AGH	"	1945	3	19	26	13	—	27
Sweet Home	A	River	1945	3	24	20	2	—	8
The Dalles	BGH	City	1945	3	75	133	8	—	72
Tillamook	A	"	1943	3	24	24	8	5	15
Toledo	A	"	1939	3	20	20	6	—	12
Troutdale	BGH	Wells	1944	3	106	105	11	4	43
Vernonia	A	City	1945	3	24	22	5	—	14
Warrenton	AG	"	1943	3	15	19	8	—	19
West Salem	BGH	Wells	1944	3	56	60	6	—	46
Woodburn	BGH	"	1945	3	87	101	2	—	46

WASHINGTON

Location	Key	Supply	Date of Analysis	Anal. Ref.	Tot. Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Chloride as Cl	Sulfate as SO_4	Silica as SiO_2
Aberdeen	AE	City	1928	1	30	30	4	5	6
Bellingham	AE	"	1932	1	19	17	6	9	7
Bremerton	AGH	"	1932	1	31—51	39—68	4—5	2	15—23
Camas	AGH	Well	1949	3	31	30	5	4	27
Everett	A	City	1932	1	13	15	1	3	6
Hoquiam	AGH	"	1932	1	23	30	5	2	18
Longview	CFGH	"	1923	1	171	208	13	4	56
Olympia	BFGH	"	1928	1	76	97	4	12	45
Spokane	CF	"	1931	1	123	174	2	17	13
Sunnyside	CFGH	"	1950	3	174	144	18	40	68
Tacoma	A	"	1931	1	17	21	2	3	14
Vancouver	BFGH	"	1931	1	61—74	66—103	3	4—6	47—53
Walla Walla	AGH	"	1931	1	28	38	1	2	34
Walla Walla	AGH	"	1950	3	16	30	2	10	31
Wenatchee	BFGH	"	1931	1	66	65	1	13	75
Yakima	AGH	"	1930	1	24	50	3	4	17

Testing Protective Coatings For Hot Steel Tubes

Fabricating a heating element which could withstand great temperature differences was the problem. Here is the story of the research that supplied the answer.

By E. H. MOHR

Product Research and Development Department, Day & Night Division, Affiliated Gas Equipment Co., Inc., Monrovia, California

SOME YEARS ago, when Day & Night first developed the Panelray wall model room heater using exposed steel tubes as a source for infrared heating, one of the main problems was the development of a suitable protective coating for these steel tubes.

Because it was necessary to provide protection to both inside and outside of the tubes, the coating had to be one that could be applied by dipping methods. Other factors which had to be considered were color and texture of the finish, permanence of quality and appearance, cost of application and availability, and adaptability to the assembly line procedures in connection with production of the heaters.

Tests and Experience

The first coating used was a two-coat porcelain enamel finish consisting of a standard (blue) ground coat covered by a glossy brown finish coat. It was discovered that this double coating was not consistently able to withstand the thermal shock resulting from the alternate heating and cooling of the tubes, particularly when the heater would be subject to "on-off" type of thermostatic control. Since a single coat enameling would not result in a suitable color, it was necessary to investigate other finishes.

Next coating used was a non-fused ceramic finish which resulted in a grey, dull surface. Although this was a deviation from the color and texture previously used, the tubes appeared to blend into the coloring of the other parts of the heater, and the new color was considered acceptable.

This coating seemed to be the solution to the problem since it was not fragile like the porcelain enamel and would stand up under the thermal shock. However, within a year of the time that it was adopted, instances were reported from areas of high atmospheric humidity stating that rust spots were appearing on the coated surfaces of the tubes, indicating that the coating was too porous, allowing the moisture to penetrate and produce corrosion of the steel.

Experience with coatings thus far showed that, in addition to possessing the characteristics which could be determined visually, standard laboratory tests were required to indicate the ability of a coating to resist atmospheric humidity (porosity test), to withstand thermal shock, and to provide satisfactory bonding. For the porosity test, we developed a mist tunnel, in which the samples to be tested are suspended in an enclosure above a steam bath, the samples being subjected to continuous exposure to the steam vapor and to intermittent blasts of air.

This test produced an accelerated corrosion condition which would indicate within a very short period of time whether or not the coating had sufficient corrosion resistance. The test for thermal shock is an adaptation of the test developed for porcelain enamel finishes, and consists of heating a sample to 1100° F. and quenching with water at 60-70° F. The standard test for bonding is conducted on an impact testing machine and consists of dropping a one inch steel ball from sufficient height to produce an indentation in the coated surface and then inspecting the indented spot for quality of bonding. A reasonably accurate indication can also be obtained by striking the test sample with the ball end of a ball pean hammer.

Production Standardized

In addition to these tests, a sample tube is usually installed in a Panelray heater and subjected to intermittent

operation of the heater, thus being exposed to alternate heating and cooling.

During the period that the non-fused ceramic coating was being used, numerous new applications of porcelain enamel finishes were developed. Outstanding among these was the use of Bureau of Standards Specification A-19 (standard cobalt blue ground coat) porcelain enamel on steel exhaust manifolds for airplane engines. Since no difficulty was encountered with thermal shock in this case, interest in the use of porcelain enamel for the heating tubes was again aroused, but the bonding and color characteristics of the standard A-19 porcelain enamel were not suitable.

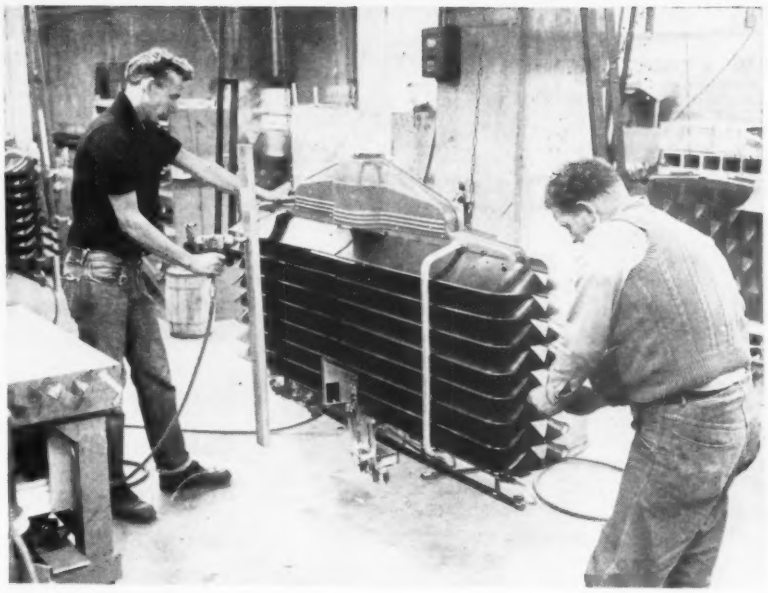
However, through 2½ years of research conducted jointly by Day & Night and engineers of the enameling industry, a modification of the A-19 formula was developed which produced a dark grey coating which was satisfactory in all respects except color. By applying an acid etch (later replaced by an alkali etch) the color of the finish was altered to produce a lighter grey color similar to that of the non-fused ceramic coating previously used. The light grey porcelain enamel became standard production in August 1948.

Few Rejects

Subsequent research had developed a further modification of the A-19 porcelain enamel having a mottle finish with the desired lighter grey color, thus eliminating the necessity for the etching process. Experience has shown this coating to be very successful with only a small percentage of the tubes being considered unsatisfactory for use on the heater assembly line. The principal causes for rejections have been (1) mechanical damage resulting from handling, (2) insufficient coverage, (3) too heavy porcelain on reworked tubes and (4) poor enameling steel used in fabrication of the tubes.

The first three types of rejects are salvaged by re-enameling the tubes, stripping the original coating if necessary. The inferiority of the enameling steel is apparent only after the tubes have been enameled and these rejects cannot be salvaged. Fortunately this group represents only about 1.0% of the total tubes processed.

The porcelain enamel finish resulting from these years of development is considered most satisfactory and is currently being applied to the heating elements for all products in the Day & Night line, including the new Overhead Panelray heater designed for commercial and industrial heating applications.



ADAPTABILITY TO ASSEMBLY LINE PROCEDURES for production of the heaters was an important requirement during the engineering and research program. The porcelain enamel finish finally developed after many tests not only provides the necessary physical qualities for heating elements of the Panelray units but can be applied by dipping methods to protect both the inside and outside of the hot tubes.

ABOVE—Final assembly of an overhead type.

BELOW—Initial assembly of the wall model.

Colorado Mobilizes Resources For Faster Industrial Growth

Helping industry to make the best of Colorado's resources is the challenging aim of a state-wide private organization

By ROLLE RAND
Executive Director
Colorado Resources Development Council, Inc.

THIS NATION's balance of economic power is today tending to shift from East to West. The eleven Western states are again, in their brief and tumultuous history, standing on the threshold of new frontiers. But these new frontiers are no longer geographic; their foundations are in the development of the West's resources — present and potential, natural and human, industrial and scientific.

In time of war, an army division does not attack an enemy position unless it has sufficient military intelligence to guide the procedure and direction of the assault. Equally, in time of peace, a state cannot successfully attempt to combat the potential enemy of unemployment unless it has sufficient industrial and resources intelligence to guide the direction and procedure of its program.

Out of the realization of these facts grew the organization known as the Colorado Resources Development Council.

Non-political and Private

Some two hundred leading citizens, representing every field of endeavor in Colorado attended a conference at the State Capitol to form an organization which would undertake a program of industrial development of the State's resources.

STATED objectives of CRDC are to speed up the healthy economic growth of Colorado; to inventory and develop all of the State's resources, present, potential, industrial, natural and human; and to assist existing industry to expand; to encourage industry and business outside the State's borders to locate within Colorado; to keep resident citizens abreast of significant economic developments; and to serve as a fact finding and coordinating agency for all types of information pertinent to the State.

That November, an Executive Committee was named and the organization came into being. On April 19, 1948, the organization was incorporated as a voluntary, non-profit agency under the title, "Colorado Resources Development Council."

CRDC is non-political and privately financed. The organization's more than 300 members are leaders in industry, agriculture, business, labor, professions and education throughout the State.

Membership in the Council, open to everyone, now embraces all sections of Colorado. The Board of Directors is made up of a member from each of the Council's seven districts in the State, the chairman of the permanent resources committees on Research, Oil and Gas, Labor, Transportation, Water and Power, Financial Services, and representatives of manufacturing, utilities, agriculture, mining, transportation, tourist, federal government, labor and the press.

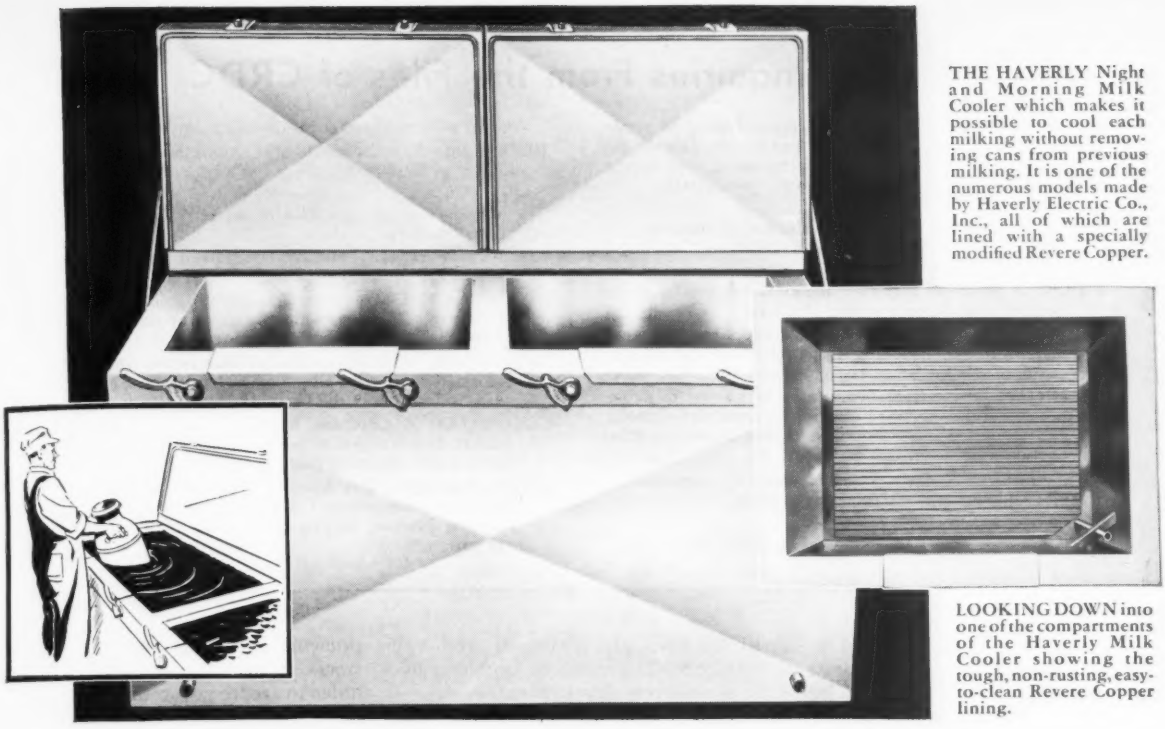
The Council is able to travel the course taken by its extensive activities with a small paid staff because of the expert and voluntary assistance received from its members and the State's educational institutions.

Equally, CRDC has established effective liaison with leading corporations, local Chambers of Commerce, the Colorado State Chamber of Commerce and Federal and State agencies. Thus, the Council approaches State and community problems through the expert advice of its members, augmenting, wherever necessary, the services of Federal, State and community agencies. Where no qualified agency exists, CRDC deals directly with the problem to be met.

More and More Queries

During the less than two years of its existence, the stature and activities of the Council have increased many fold. In 1949, requests for information came to the Council from forty-three states, the District of Columbia and three foreign nations.

By comparison, the year 1948 saw the Council answer requests from only thirty-nine states. In most cases, complete information to answer these queries was not available from any other single Federal, State or private agency.



THE HAVERLY Night and Morning Milk Cooler which makes it possible to cool each milking without removing cans from previous milking. It is one of the numerous models made by Haverly Electric Co., Inc., all of which are lined with a specially modified Revere Copper.

LOOKING DOWN into one of the compartments of the Haverly Milk Cooler showing the tough, non-rusting, easy-to-clean Revere Copper lining.

HOW COPPER, THE RIGHT COPPER *Increased Sales* OF HAVERLY MILK COOLERS

On farms throughout the country mechanical refrigeration for the cooling of milk has been growing by leaps and bounds. Late in 1945, there were many complaints from the farmers regarding the war-quality rustable material used to line these milk coolers. They were difficult to clean and were rusting out rapidly.

When restrictions were lifted on copper and copper alloys, the Haverly Electric Co., Inc., Syracuse, N. Y., came to Revere to see if non-rusting, easy-to-clean copper could be used. The solution was not as easy as it sounds. For the copper, in addition to its non-rusting and high thermal conductivity properties, also had to be strong enough to withstand the constant banging of 80-lb. cans of milk, and at the same time sufficiently ductile for easy fabrication.

Two Revere sheet metal specialists and their staffs went to work. Tests showed electrolytic copper was not mechanically feasible. Then tests were run with several modified coppers. One of these was found to possess *all* of the requirements.

This use of copper as a liner for milk coolers further resulted in the development of the Haverly "Floating Ice" feature. The ice forms on the side walls of the smooth copper liner; works loose and floats to the surface, adding cracked ice cooling around the top of the can at the cream line, where fast and efficient cooling is needed and proves most profitable. Hence a more efficient unit. Also, due to copper having the highest heat-conductivity of any other commercial metal, copper cooling coils are attached to the outside of the copper lining. This results in greater cooling efficiency and easier cleaning. Here again Revere helped. The Revere welding department developed a fast method of attaching this Revere Dryseal Copper Tube to the lining.

The final outcome is that sales of the Haverly Electric Co., Inc., have increased until they are selling all they can produce of this type cooler, while the mutual knowledge gained has resulted in this company expanding its use of special copper alloys in coolers for other industries.

Perhaps Revere can be of help in developing or improving your product, increasing your sales. Why not call the Revere Sales Office nearest you next time you have a problem in metals?

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Aveune, New York 17, New York

Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.

Sales Offices in Principal Cities, Distributors Everywhere.

Pacific Coast District Sales Offices in San Francisco, Seattle, Los Angeles.

Sample Inquiries From the Files of CRDC

CALIFORNIA—A rubber manufacturer desired to establish a warehouse in Colorado and sought data on the amount of canvas and rubber footwear sold in the State, population by age groups, precipitation and climatic conditions.

NEW YORK—A man requested information concerning a good Colorado location for a combined hardware manufacturing plant.

UTAH—A processer requested material concerning resin-bearing coal deposits within the State.

OHIO—Information requested on Colorado iron and steel manufacturers, including plant locations and all deposits of the necessary raw materials.

MICHIGAN—An entrepreneur stated he wanted to move his sash and door manufacturing business to Colorado and requested information on timber resources, production, and wood working firms.

NEW JERSEY—An air products company requested a bibliography of geographic maps, folios and bulletins relative to Colorado.

TEXAS—A manufacturer requested assistance in re-locating a hide and leather processing plant in Colorado.

RHODE ISLAND—A textile firm sought data on the feasibility of establishing a wool scouring plant.

CALIFORNIA—A Vacaville manufacturer requested Colorado natural gas rate data in the Greeley and Grand Junction areas.

CONNECTICUT—A radiator manufacturer requested maps showing local Colorado trade areas.

PENNSYLVANIA—A manufacturer of agricultural machinery requested information on plant sites and the local labor force in northern Colorado.

NEW YORK—A manufacturer of insecticides requested information on plant sites, power, labor, taxes, etc., for plant re-location in the La Junta area.

COLORADO—A Colorado factory executive asked for market data in regard to hot water heaters, power lawn mowers and similar appliances.

OHIO—A group of this State's businessmen requested information concerning Colorado laws applicable to business licenses, regulations and the State's general tax structure.

In 1949, the largest number of inquiries came from Colorado. The State of New York, for the second year, led in the number of queries from outside the Commonwealth, with California following closely. Other states from which queries were more than usually heavy included Massachusetts, Missouri, Ohio, Illinois, Texas and New Jersey.

What They Ask

While the total number of queries in 1949 was more than double those received in 1948, it is significant to note that the greatest increase in 1949's queries, 3,000 per cent, were concerned with Colorado business opportunities and employment aspects.

In addition, there were thirteen times as many requests for agricultural material, eight times the previous number of queries for tourist data, almost six times the amount for market information, twice as many requests concerning Colorado's raw material resources, and an increase of 414.3 per cent for CRDC data and assistance in plant relocation and industrial decentralization.

Added to the foregoing written requests for CRDC aid in 1949, the Council staff answered 3,900 telephone queries and conferred with 1,304 callers at the CRDC offices.

Newsletter and Speakers

Meanwhile the Council's monthly newsletter, with a circulation in excess of 2,000, directed attention to the CRDC Community Industrial Expansion Program. Staff members, since January, 1949, have held conferences in 68 communities, traveled more than 19,000 miles and addressed approximately 8,700 persons on problems of local resources development.

The Council seeks to secure, at a minimum, one new industry for each Colorado community which has a population of at least 1,000 persons.

Many Plants Relocate

Outlines are furnished which explain procedures to be followed in conducting community surveys to determine all local resources of significance to new industry.

Facts and figures are gathered pertinent to market, overhead, climatic conditions, labor force, housing and recreational facilities, tax structure, plant sites, power, water, etc.

Once a community survey is completed, the CRDC assists that community in analyzing the survey's findings and determining what the community has, what it would like to have, and what, logically, it should have.

Once a logical industry is selected, a representative of the CRDC is prepared to travel to the area in which the desired industry is located, accompanied by representatives of the community. The owner or principal stockholders of the industry are contacted and attempts are made to convince them it would be to their firm's advantage to move to Colorado.

This program already has begun to bear fruit. A detailed list of industries now contemplating relocating within Colorado would be too numerous for mention in this space.

As an adjunct to the foregoing program, the Council seeks to assist existing Colorado business and industry to expand. It advises the State's entrepreneurs on how to secure new contracts, on methods to be followed in order to secure government contracts, or sub-contracts.

The Crystal Ball

Colorado's future is unlimited. With the decentralization of industry and population and the trend Westward, the State can enter an era of industrial and resources expansion which could bring further prosperity and security to residents of the Commonwealth.

This additional prosperity, the Council realizes, will not fall easily into our laps, even as a new industry does not come into Colorado neatly packaged and tied with a pink ribbon. In order to achieve the desired results of industrial and resources development, intelligent planning and coordinated effort is necessary on the part of all persons and communities within the State.

By the same token, Colorado understands that it cannot progress unless the West as a whole progresses. Consequently, decisive and cooperative action on the part of all the eleven Western states is necessary if the West is to come into its economic own.

A free society cannot be static. We must not stand still and take what comes. We must make our own future. The CRDC has accepted the challenge of working for Colorado's future in order that the State will achieve its rightful piace in the nation's economy.

Equally, the Council is prepared to accept the challenge of working toward the acceleration of the incvitable development of the West. The promise is rich. The rewards are great. The time is now.

American Blower . . . a time-honored name in air handling

San Francisco is another city with a conveniently located American Blower Branch Office to provide you with data and equipment for air handling. You can reach American Blower in San Francisco by calling Sutter 1-1024. In other cities, consult your phone book.

CUSTOMER COMFORT . . .

In San Francisco, or in your home town, customer comfort is getting more and more attention from sales-minded store executives. Many have already learned that American Blower Sirocco Fans make a big difference. Their multiblade fans are unexcelled both in quietness and compactness. They require less space than other fans of equal capacity and are available in a complete range of sizes and arrangements. Write for our Bulletin A-801 for specifications and data or contact our nearest branch office.

SAVE ON FUEL . . .

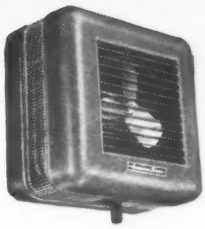
Fuel savings alone often will pay for a new heating system when you replace obsolete equipment with American Blower Unit Heaters. For example, a manufacturer of specialty equipment converted only half his plant to unit heater operation. Fuel savings were so great that he found he could convert the other half and pay for the system in 3 years with the fuel savings alone. American Blower carries a complete line of Unit Heaters, including self-contained gas-fired models and models for steam or hot water heating systems, wall- or ceiling-mounted.

MINIMIZE DUST . . .

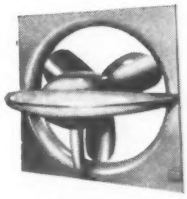
With increased emphasis nowadays on dust and smoke prevention in cities and factories, here's a case history that may interest you. A manufacturer in Detroit had a dust problem in his plant and called on American Blower for advice. We were able to show him that with an American Blower Dust Collector he would not only be rid of the dust nuisance, but at the same time would recover valuable materials from the air. He appreciated our on-the-spot service. We appreciated his order.

LOOK US UP . . .

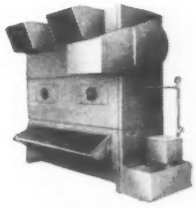
With our new plant in San Leandro, Cal., we can save you time, money and provide you with faster service on most American Blower products. For data, call or write our nearest branch office.



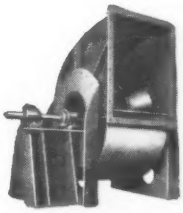
Unit Heaters



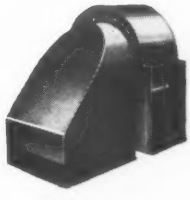
Ventura Fans



Air Conditioning Equipment



Industrial Fans



Utility Sets

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Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

YOUR BEST BUY AMERICAN BLOWER AIR HANDLING EQUIPMENT

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Quality Control by "Sampling" Brings Economy in Production

100% inspection can prove costly in terms of material and manpower. Applying the simple principles of statistical sampling speeds up both inspection and production.

By FRANK C. HUND
Quality Evaluation Laboratory Director
United States Naval Magazine
Port Chicago, Calif.

QUALITY cannot be inspected into a product. It is a function of the fabricating process.

Once defectives have been produced, certain types of inspection tend to make quality by removing the defective pieces and allowing the good pieces to be passed, but this method of achieving quality is costly in terms of material, manpower, and money.

Further, it is the primary duty of the Navy inspector to measure quality and not to make it. The Government inspectors at the contractor plants normally do not themselves perform process inspection (inspection of or at a machine) or screening inspections (inspections which remove the bad pieces and pass the good). The Navy inspector assists and advises the contractor in these inspections but does not relieve him of his responsibility for such inspections.

Accuracy . . .

To assist the inspection representatives of the Bureau of Ordnance to perform their primary function efficiently and with a high degree of accuracy, statistical quality control techniques have been provided them. Briefly, the Navy inspector employs two principal techniques in his work: (1) Standard Acceptance Inspection for Attributes, and (2) The Statistical Quality Control Chart. Both techniques permit him to accurately and economically measure quality.

Navy acceptance inspection serves as a final check upon the quality of materials produced. The Navy accepts or rejects material submitted to it for inspection in terms of whether or not it is within the tolerance limits specified. The Standard Acceptance Inspection for Attributes provides the impartial tool by which the inspector may evaluate the quality of material produced by a contractor, or by the Navy within its own plants. This method, also known as the Standard Sampling Inspection Procedure, or as Statistical Quality Control Sampling, employs the mathematics of probability to differentiate between chance variation, and an assignable variation which may be discovered and corrected. It is not within the scope of this article to present the mathematical principles in support of Statistical Quality Control (S.Q.C.). However, it is pointed out that the principles involved are simple and readily appreciated. The interested reader is referred to the many reference texts that are available on this subject.

It is an important fact to the Navy and to its contractors that the sample size drawn as representative of a lot does not increase proportionally with the size of the lot. The economy to be achieved by proper lotting is readily apparent by examination of the following table abstracted from Joint Army-Navy Standard 105 dated 16 Feb. 1949:

Size of Inspection Lot	*Sample Size*
Under 25	10
25 to 50	15
50 to 100	20
100 to 200	30
200 to 300	40
300 to 500	55
500 to 800	75
800 to 1,300	115
1,300 to 3,200	150
3,200 to 8,000	225
8,000 to 22,000	300
22,000 to 110,000	450
110,000 to 550,000	750
550,000 and over	1,500

Statistical Quality Control involves the quality evaluation of a lot based on an examination of a segment of that lot. When only a sample of the lot is examined, it is recognized that there is a chance that the sample will be inaccurate, in that it will fail to show the correct proportion of the defectives and other characteristics in the lot. This is known as sampling error.

. . . and Speed

The question is frequently asked, "Why this risk when 100% inspection suggests guaranteed results?" First, it

Quality control practices in the West, as found in *Western Industry's* survey of 211 plants, were discussed in the November issue.

No Other Oil KEEPS ENGINES SO CLEAN... SO FREE FROM WEAR!

Especially in winter, when operating strain is heaviest, a clean engine really pays off in extra power. And in automotive and stationary units of every type, Heavy Duty Tydols have proved they *keep engines cleaner* than any other oil. Proved they *measurably reduce* engine wear!

Far richer in high detergency additives, they quickly loosen carbon, sludge, varnish deposits. Their active dispersiveness renders harmless these abrasive foreign deposits, by holding particles loosely in suspension. And their low pour point insures instant lubrication even in coldest weather. Yes, every quart . . . every drop *cleans* as it *protects* as it *lubricates*. Does *all three* jobs . . . not just one!

Rely on your Associated Representative for expert help on any lubrication problem.

Tune in . . . enjoy the 25th Year of Associated Sportcasts

Here's Actual Proof!

Placed in a well-known motor oil *without additives* (left), fuel soot, road dust, and other engine deposits quickly *settle,* forming gummy, power-robbing sludge.

Rich in detergent additives, Tydol HD (right) *dispersed* these deposits. Held harmlessly in *suspension* until oil is drained, they *cannot collect* to form sludge.

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TYDOL HD—For high speed gasoline, butane, diesel-fueled engines in automobiles, busses, trucks, tractors, stationary units under normal Heavy Duty conditions. SAE grades 10, 20, 30, 40, 50. Sold in cans and drums.

TYDOL HD S-1—Higher detergency level than Tydol HD. For every type of engine subjected to frequent cold starts, and to severe and continued overloading. SAE grades 20, 30, 40. Sold in drums.

TYDOL HD S-2—Highest detergency level of the HD series. For high performance, super-charged diesel engines using all types of diesel fuels, under the most extreme conditions. SAE grade 30. Sold in drums.

TYDOL HEAVY DUTY Compounded Motor Oil

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CLEANS as it PROTECTS as it LUBRICATES

TIDE WATER ASSOCIATED OIL COMPANY

Quality Evaluation Saves for the Navy

BY EXPANDING its quality control program to include what is known as the Quality Evaluation Program, the Navy was able in a seven months period to save $240,000 in one laboratory alone of the five Quality Evaluation Laboratories established to carry on continuous inspecting and testing of existing stocks of ammunition on hand when the war closed. This required inspection and testing of $1,140,000 worth of fleet-returned ammunition.

These laboratories are located at Naval Ammunition Depot, Crane, Indiana; Naval Ordnance Depot, Puget Sound, Bangor Annex; Naval Mine Depot, Yorktown, Virginia; Naval Ammunition and Net Depot, Seal Beach, California; and Naval Magazine, Port Chicago, California.

The result of this quality evaluation program was particularly noticeable and enlightening at the beginning of the current war in Korea. The quality and operability of the ammunition issued from navy stocks for combat use in the Korean War was far superior to that issued for combat use at the beginning of World War II. This condition existed because of the Navy's peace-time policy of continually evaluating and reconditioning the ammunition in navy stocks.

may be readily shown that while sampling errors may and do occur during batch or lot inspections, the limits and nature of this type error may itself be accurately determined by S.Q.C. techniques so that the average quality of the material being inspected will not fall beneath a desired level. As cumulative data are made available, the quality determinations made by S.Q.C. methods become increasingly accurate and make possible pertinent analysis of the production and inspection processes.

Because of the small percentages of samples generally required for S.Q.C. methods, inspectors have sufficient time to examine thoroughly the items submitted to them for inspection and are not so much subject to the occupational fatigue brought on by other inspection plans. The necessity for retaining data under the plan assures the flow of information vital to management that is frequently unrecorded, hence lost, under other methods of inspection.

In contrast, 100% inspection does not provide the guarantees expected. Inspection experience has shown time and time again that 100% inspection is fallible. The requirement that inspectors maintain the pace set by production personnel, together with the monotony of such continuous inspection, frequently results in occupational fatigue that lowers the quality of the inspectors' work.

The greater use of gauges and instruments required by 100% inspection increases the chances of equipment trouble and inaccuracies, as well as higher maintenance costs. The necessity for inspectors to "keep up" with production frequently does not permit the thorough examination of the item submitted for inspection, and results in the failure to observe important defects, as well as the recording of inaccurate measurement values.

Why Not 100% Inspection?

To illustrate the fallacy of 100% inspection, the following test has been frequently conducted: A lot of items with a known number of clearly defective units present, was submitted to 100% inspection. In one case on record the resubmission of such a "rigged" lot four (4) times, removed only 98% of the defective items. In the first inspection only 68% of the defective items were removed. Secondly, 100% inspection is costly in comparison with statistical sampling and does not provide the wealth of analytical information possible to obtain from S.Q.C. Further, the information provided by S.Q.C. methods is current and can be utilized in the immediate correction of process or inspection irregularities.

In addition to S.Q.C. sampling being employed by the Navy inspectors, it is also frequently employed by the contractor to establish the satisfactory quality of their products prior to submission to the Navy for acceptance.

Control Charts

The control chart is also a simple but effective application of the theory of probability. Inasmuch as variation is inherent in the measurement characteristics of any product, the control chart provides a method whereby the degree and constancy of this variation may be determined, and a means by which the units being produced may be accepted or rejected in relation to the specification tolerances.

The process control chart differs from the acceptance plan discussed above in that it is applicable to the process itself rather than to the evaluation of the quality of the end product. The process control chart provides a means of controlling the quality of a product as it is being fabricated as opposed to attribute inspection plans that serve to measure quality, or to make quality by the removal of defectives. It is a means of regulating the process so as to prevent the occurrence of defectives as opposed to the subsequent need for screening them out.

Bureau of Ordnance employs process control charts within its own plants, and in some instances uses process control charts in contractor plants to determine the quality of subcomponents prior to final assembly of the product. In every instance, the Bureau encourages and supports the use of process control charts by the contractors as a means of their producing higher quality material at lower unit costs due to savings in manpower, materials, etc. The simple mathematics in support of the control chart techniques, and the methods by which they may be set up and used to advantage, are clearly explained in the same reference texts referred to above.

When Statistical Quality Control is applied throughout a plant, the overall cost of inspection made by the plant prior to Navy acceptance inspection becomes considerably less expensive, and the contractor has the additional assurance that the specifications have in fact been met, and that the Navy will accept the lot submitted to inspection.

S.Q.C. Methods Applied By Contracting Plants

ALL manufacturing plants with Government or commercial contracts engaged in manufacturing fire control equipment, underwater ordnance, guided missiles, gun mounts, launchers, and aviation ordnance have navy quality control groups in the plants inspecting and accepting the equipment, using standard quality control procedures in accordance with the established acceptance quality level for that product.

Companies at present doing contract work for the Navy Bureau of Ordnance include Norris Stamping Co., Aero-jet Corporation, Eastman Kodak, Ford Instrument Co., Westinghouse, Edison, etc. Most of these commercial companies have their own company quality control people working in conjunction with the navy quality control group in their plants. It is now standard procedure that any company awarded a Navy contract administered by the Bureau of Ordnance will have the product manufactured under that contract accepted by the Navy on the basis of the quality control acceptance procedures.

Ford Teaches S.Q.C.

A STATISTICAL quality control school for vendors manufacturing Ford parts is being conducted this month at the Ford Motor Company in Los Angeles by a team sent out from Dearborn for this special purpose.

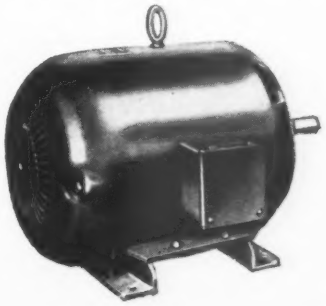
Plate glass polishing for Ford demands polished motor performance

Polishing the clear, safe-vision glass that is turned out in the Ford Motor Company glass plant at Dearborn, Michigan, is a big job. Huge lines of these 60 grinding and 100 polishing machines, which are so delicately aligned that they compensate for the curvature of the earth, are in daily 24-hour operation. This calls for polished performance . . . perfect, dependable service . . . on the part of the motors that power the tireless machines. It is significant that a battery of Wagner 40-hp type CP totally-enclosed, fan-cooled motors are used at this rigorous application.

For *your* requirements . . . there is a Wagner motor to answer every need for a standard type of electric motor in sizes from 1/125 hp to 400 hp . . . a complete line for all current specifications, with a wide variety of enclosure types and mountings.

Wagner engineers are qualified to specify the correct motor for your needs. Consult the nearest of our 31 branch offices or write us.

Continuous, unfailing power for the Ford plant grinding and polishing machines is furnished by Wagner 40-hp type CP, 445 frame, 1200 rpm. motors. There is a specific motor equally applicable to your exact need in the complete line of Wagner standard motors.



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BRANCHES IN 31 PRINCIPAL CITIES

TECHNICAL SHORTS

Some Tips on Keeping the Roof Over Your Plant

FOR GENERATIONS, people have relied on corrugated galvanized steel sheets to provide long-lasting roofing and siding. They still do.

For generations, people have thought that when these units rusted, it was necessary to wire brush them to prepare the surface for a coat of zinc paint. New information supplied by American Zinc Institute says that wire brushing "now appears to be economically unsound and unnecessary."

Perfect preparation of the surface, which is compulsory in most painting operations, would require wire brushing, but years of testing in normal roof exposure proves that the results are only slightly better, if any, than those obtained with an ordinary stiff-bristled fiber broom.

Certainly it appears that wire brushing fails to increase service life enough to justify the added expense in time and labor.

Metallic zinc paint, as made by more than 150 manufacturers in this country, is a mixture of 80 per cent zinc dust and 20 per cent zinc oxide in linseed or soybean oil. It is battleship gray in color, (unless colors are added), weighs approximately 23 pounds per gallon and covers 600 to 800 square feet per gallon, depending on the condition of the surface.

Federal Specification TT-P-641 permits substitution of limited amounts (up to 10 per cent) of coloring materials for an equivalent percentage of zinc oxide. Thus various shades of red, green, buff, etc., may be obtained.

It is theoretically best to paint roofs or sidings of zinc-coated corrugated steel before actual rusting begins—when dark areas are first observed here and there over the surface. With ordinary roofing, this appearance will develop usually after 10 to 12 years' service.

BRUSHING with ordinary stiff-bristled broom is adequate preparation for painting galvanized roofs with zinc paint.

However, Institute engineers generally recommend painting when 10

Continued on page 52

Bronze Extrusions Cut Costs at Boeing

ELEVATORS and rudder on the tail sections of airplanes employ counterweights to eliminate flutter and thereby to obtain smooth control in flight. Steel normally has been used for this purpose, but use of steel for the counterweights on the Stratojet would have required shifting of the fluxgate compass from its most ideal locations.

Boeing engineers, in designing the B-47B Stratojet, sought a nonmagnetic material for the counterweights. Bronze was suggested. Even though its initial cost is higher than steel, its use, they reasoned, would solve the compass location problem if the material could be made available in properly extruded shapes. Further, if these extrusions could be furnished in cross-sections closely approximating the shape of the finished parts, the counterweights could be turned out with less machining.

Bronze was recommended along with a change in part design to make possible a shape of proper tolerance and balance. Experimental runs were made in which final design problems were ironed out. The material then was supplied in the revised design. The saving in machining time—under what normally would be required to obtain the desired cross-sections of steel—was even greater than had been estimated.

Saving in machine time has more than offset the increased initial cost of the bronze. In addition, finished parts have been delivered quicker and machine tools and skilled machinists have been freed to do other needed work. Further, the net savings were great enough to promote the use of Revere Extruded Architectural Bronze even for counterweights where magnetic effect is not a factor in selection of materials.

Assembling the bronze extrusion sections into Boeing's new B-47B Stratojet Bomber. Saving in machine time offset initial cost of bronze.

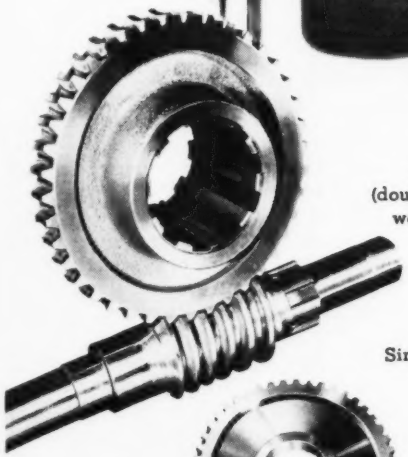
wheels of western progress

GEARS

worm gears... can provide high ratios, smooth motion, and load-holding features. Both single and double-throated types of worm gearing, as well as all other types of gears, are manufactured in our extensive west-coast facilities.

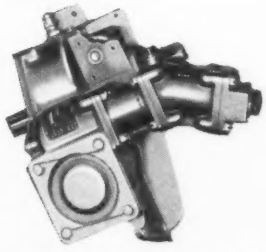
different types Single-throated worm gearing, in which the gear partially envelops the worm, have advantages of efficiency and life over the rarely used non-throated type. Double-throated worm gearing—exemplified by Cone-Drive gears—in which each element partially envelops the other, have even greater efficiency, capacity, and life.

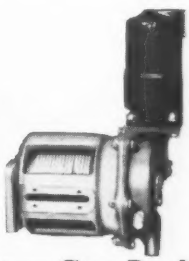
sample application These precision-quality aircraft actuators illustrate applications of worm gearing. Below right, conventional worm gearing in combination with spur and planetary gear sets, provide a ratio of 585:1 in a cable-drum actuator. Below left, a wing-flap actuator incorporates two sets of cone gears for a total ratio of 250:1. Both are typical Pacific-Western products, properly designed and manufactured for a specific application.



Cone-Drive (double-throated worm gearing)

Single-throated Worm Gearing





in the West, it's Pacific-Western Gear Products

For help in any problem of mechanical-power transmission, be sure to consult a specialist in the design, production, and application of gears and geared products. Call or write your nearest Pacific-Western Office.

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Pacific Gear & Tool Works

Plants at: Seattle, San Francisco, Lynwood (Los Angeles County)

Representatives: Portland, Denver, Houston

AGMA MEMBER

Roof Maintenance

. . . Continued from page 50

per cent of the surface has weathered sufficiently to show rust. If only spots of rust have developed, give them a coat first, then paint the entire surface.

The best time to paint is in warm, dry weather when the paint will spread well and dry readily. Paint should not be applied when rain is threatened, or when the surface is damp with dew.

Hand brushing is the simpler and quicker method for small jobs. Paint may be brushed out, but the thicker the film (so long as the paint does not run), the longer the life of the zinc coating whose function is to protect the steel sheet.

Where areas of several hundred square feet are to be painted, spray painting is preferable, through coverage will be about 25 per cent less than that gained by brushing—some 450 to 600 square feet per gallon sprayed.

For the proper atomization, 100 to 120 psi. should be applied to the air line. For best results, an external-mix gun should be used—the type which brings the paint out through a center orifice, and applies air under pressure around it. Trigger the gun at the end of each stroke to avoid piling up the paint in uneven laps.

Plans Afoot to Solve Western Manpower Problems

ANTICIPATING an increasing labor demand for key defense production, agriculture and essential civilian production in the spring of 1951, the Regional Office, Bureau of Employment Security, called defense manpower officials from the five Western States and the Territories of Alaska and Hawaii together in San Francisco on November 15.

Three task forces of representative State, Federal and agricultural officials shaped proposed manpower mobilization plans for key defense areas and for agriculture in an initial three-day session. This was followed by a four-day session of all top manpower representatives from the region. That resulted in the final adoption of specific manpower programs, that will be applied in critical labor areas, in surplus labor areas and throughout the agricultural industry.

Plans envisage the establishment of Local Labor-Management Committees, Industry Committees, and Manpower Allocation Committees (the latter composed of claimant agencies such as the Department of Defense, Civil Service Commission, etc.), from which local and industry-wide policies and actions will stem.

This program, entirely voluntary, will seek the solution of labor force transfer, training and expansion problems, through local cooperative efforts of industry, labor and government. The local employment offices of State and Territorial Employment Security Agencies will be the principal machinery through which the policies and plans will be carried out.

Research Would Like Power From Wood Wastes

THE PORTLAND, Oregon Chamber of Commerce and the Oregon Forest Products Laboratory are cooperatively supporting a research program designed to use wood wastes and residue to generate power for operating sawmills and other plants that are isolated from electrical and water power but are located near readily available supplies of wood.

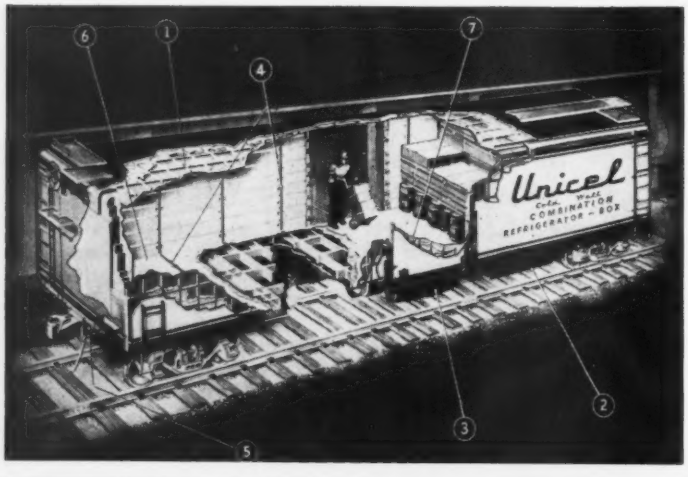
George H. Atherton, Corvallis, who conceived the idea, is now designing and constructing a pilot plant.

Also cooperating on the project are the engineering experiment station at Oregon State College and the Boeing Airplane Company. The work is being carried on at the Oregon Forest Products Laboratory.

Plywood "Reefers" Make Debut

THE ACCOMPANYING cutaway drawing explains the features of the revolutionary new Unicel combination freight-refrigerator car, the result of several years' secret research by the Pressed Steel Car Co., Inc. Its highlight features include:

Construction: Made of cellular laminated super-strength plywood (1), molded and pressed under tremendous electronic energy into a single unit structure, lighter yet stronger than steel in this usage.



Unique "cold wall" is similar to the most up-to-date household refrigerator. Frigidaire mechanical refrigerating unit (2) is powered by Diesel fuel enroute (3), by electricity at sidings and warehouses.

Damage-reducing features: New, specially developed Unistrapping braces and fastens Unicel's lading more securely to parmanent, built-in tie-downs (4). Less shifting prevents damage. Another key feature of Unicel, the Unisorb Floating Draft Sill (5) has an important shock-absorbing and damage-reducing function. A rubber sleeve mounted to the car's end-couplers cushions and absorbs road shocks reducing them until they can be passed without harm into the body.

Sanitary features: Hinged steel floor racks make cleaning easier. Sanitary interior with rounded corners (6) and smooth, flush interior door and floor construction (7) cannot pick up dirt as easily, can be washed down faster, better, is more sanitary.

AIRCRAFT MAINTENANCE

. . . Continued from page 36

replaced with new parts, with a saving in man hours during future inspections. The removed assemblies are cleaned inside and out, and the interior is repainted with a coat of zinc chromate primer. Company emblems and aircraft identification numbers are removed and painted.

While the wings are removed, the fuel and oil tanks and lines are flushed, inspected and reinstalled, and the heating and ventilating system is removed, inspected and replaced. Fuel, oil and hydraulic lines are pressure tested to the established safety factor required and necessary repairs completed.

The seats for passengers are removed, cleaned and repaired, and rugs, floor mats and the complete interior cleaned and reconditioned. Cabin windows also are inspected for cracks, and repaired or replaced if necessary. The cockpit is refinished, instruments, controls and cables inspected and repaired, and changes made for the pilots' comfort or need.

Adapting Planes

Adapting the Douglas DC-3s to our needs also required the combined thoughts of the maintenance crews, as the changes had to be engineered in order to get CAA approval, which is required for any change in the structural part of the plane if it affects the original weight and balance. Specifications and photographs were prepared with complete load tests for submitting to CAA.

Sky step doors and cabin interior baggage racks were installed to decrease ground time to three minutes at each station. The baggage rack is located near the entrance door and the passengers can handle their own baggage without waiting at the airport. The sky-door eliminates the need of an attendant to aid passengers in boarding and deplaning, an important matter in holding down expenses, for the station attendant has to be an all around man, loading and unloading mail, express and freight and giving ground service to the aircraft crew.

Interior decorating of the aircraft requires considerable study to accomplish effects which are pleasing to the eye and in harmony with the upholstering. Empire's planes are all finished the same, and the comments of the passengers are a reward for our efforts. The duplication of color schemes also allows the maintenance department a saving in the purchasing of materials and finishes.

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THE WEST ON ITS WAY

ALASKA

WAY CLEARED FOR $35,000,000 PULP MILL—Using an almost untouched government timber supply on Prince of Wales island on a 50-year program, construction of the $35,000,000 pulp mill at Ward cove, six miles north of Ketchikan, is expected to get under way next spring. Pending developments of a new magnesium process at Longview, which is expected to cut the power requirements of the Ketchikan plant tremendously, construction has been held up. The plant will be designed for a capacity of 500 tons of pulp a day. A 100-acre site has been purchased by the Puget Sound Timber Company and engineering is now under way. The present highway runs through the property, and a highway which will bypass the mill is under construction. The project on the mill is expected to take three years.

ARIZONA

NEW MOULDING PLANT AT SNOWFLAKE—J. M. Krauss Lumber Co. opens a planing mill and moulding plant at Snowflake, and is processing 50,000 feet of ponderosa pine daily. A 27-man crew is employed at the new operations.

FLORENCE SITE FOR $15,000,000 PLANT—Plans are underway by West Coast Pipe Line Company to begin construction on a $15,000,000 refinery on a 1,600-acre site north of Florence, which would provide employment for approximately 250 men. The huge project would be supplied with crude oil by a $70,000,000 pipe line from Scurry County, Texas, extending to the Los Angeles area, and would be capable of carrying 200,000 barrels of crude oil a day. It is claimed the project, when completed, will mean cheaper gasoline and oil for Arizona. Construction is expected to take about eleven months.

UNION GYPSUM PLANT SOLD—The Certain-teed Products Corporation, Ardmore, Pa., buys the Union Gypsum Company plant at 1400 East Hadley Street, Phoenix, for an undisclosed amount. The new owners plan to increase production capacity and gypsum board and lath will be produced. Key operating and sales personnel remain as members of the new management.

RFC LOAN FOR COPPER CITIES—Completion of negotiations for a loan from RFC is announced by Copper Cities Mining Co., to be used in developing copper property in Gila County. Work begins immediately and it is expected productive capacity of the new property will be about 12,000 tons of ore a day, or 45 million pounds of copper a year.

CALIFORNIA

Correction: In the October issue we published an item concerning Pelton Water Wheel Co. (Baldwin Locomotive). To clarify the item, there are two separate contracts to be identified. One is between Pelton Water Wheel Co. and California Oregon Power Co.; the other, between Westinghouse International Development Co. and the Philippine Government. In the latter case, Pelton is acting as subcontractor to Westinghouse International. The figure mentioned includes both jobs.

BEAN TIRE & RUBBER TO EXPAND—More than $100,000 will be spent by Bean Tire and Rubber Works, Santa Clara County, in expanding its facilities and buying new machinery, to accommodate expected defense contracts and to enlarge the scope of current operations. The expansion will enable the firm to enter the field of custom industrial molded goods and extruded items.

FIBRE CONCERN EXPANDS—California Cotton Mills Division of National Automotive Fibres, Inc., expands its manufacturing facilities by removal of their Bur-Twist Carpet Department to 527 23rd Avenue, Oakland. The new site, formerly occupied by the Contra Costa Laundry, covers approximately 50,000 square feet.

SYNTHETIC RUBBER PRODUCTS CO. LICENSED—Synthetic Rubber Products Co., 1538 South Eastern Avenue, Los Angeles, has been licensed to mold seals, gaskets, diaphragms and other parts from approved synthetic rubber compounds specifically developed by The Parker Appliance Company, Cleveland, Ohio, for aircraft hydraulic and aviation fuel systems. The company will also distribute Parker O-rings, seals for hydraulic service, gaskets, seals for fuel resistant service, and fuel resistant and oil resistant seals for aircraft engine applications.

PATTERSON FROZEN FOODS EXPAND—Patterson Frozen Foods purchases additional property adjacent to their present location and will begin expansion program that will add 50% to productive capacity. The new addition will be entirely storage and freezing, with the present plant devoted exclusively to processing.

SEVENTH PLANT FOR HOFFMAN RADIO—Hoffman Radio Corp., Los Angeles, adds a seventh plant to its physical activities, located at 335 So. Pasadena Avenue, Pasadena. Facilities include two single story, fireproof buildings, with 17,000 sq. feet of floor space, bringing the total Hoffman area to approximately 260,000 sq. ft.

TRUCK RENTAL CO. OPENS NEW YARD—California Truck Rental Company opens its 5th new yard on a 2½-acre location at 2727 So. Santa Fe Ave., Vernon. Conveniences of full truck rental and leasing facilities will be offered to persons in Vernon, Maywood, Huntington Park and surrounding localities.

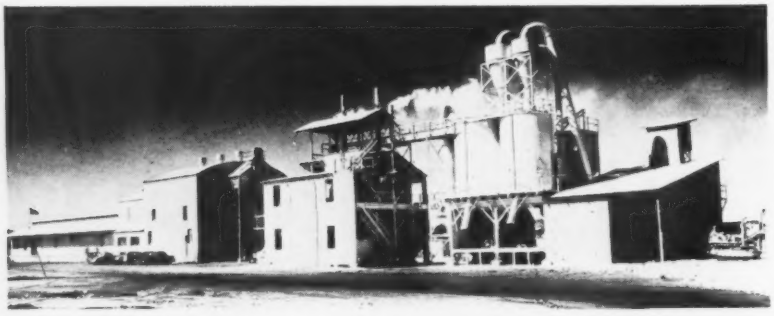
BEN-HUR ACQUIRES COFFEE ROASTING PLANT—Ben-Hur Products, Inc., purchases from General Foods Corporation, the five-story, class "A", coffee roasting and food processing plant located at Mateo and East 4th Streets, Los Angeles. A total investment of over $500,000 will be represented when the new plant is fully equipped for manufacture and processing of Ben-Hur products. The plant is scheduled to go into operation the early part of 1951.

New plant for Ben-Hur Products

$564,625 EXPANSION FOR STOCKTON PORT—Port of Stockton plans to spend over half a million dollars for construction of 160,000 square feet of additional warehouses, west of the water slip and cotton compress. The additional units, first to be added since 1936, will bring the undercover storage facilities of grain, cotton and general commodities to 796,316 square feet at the port.

EASTMAN KODAK PURCHASES HOLLYWOOD LAB.—Eastman Kodak Company purchases the Hughes Multicolor Laboratory building on Romaine Street in Hollywood, at an undisclosed purchase price. The building is three blocks west of the company's present processing station on North

Union Gypsum sells this plant in Phoenix to Certain-teed Products Corp.



MODERNIZE FOR MORE DELIVERIES ...AT LOWER COST WITH THE NEW WHITE 3000

GREAT NEW WHITE 3000 saves delivery time for Atkinson-Bell Co., Sacramento, Calif.

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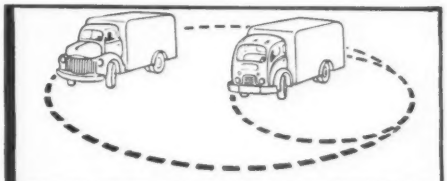
The *new* White 3000 saves maneuvering time . . . saves driver time... saves loading and unloading time. It is a new approach to reducing your delivery costs.

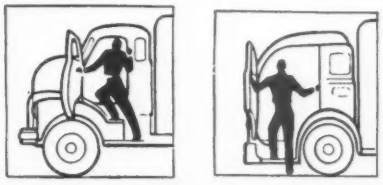
This new White is miles ahead for the specialized delivery needs in the lumber industry because it sets a new standard in truck efficiency.

Its functional design... its new weight distribution principle... its revolutionary approach to reducing truck maintenance costs—these are all exclusive advantages that make the *new* White 3000 a profitable investment that pays dividends for years.

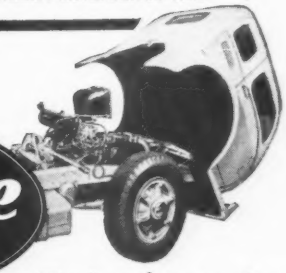
Your White Representative will be glad to demonstrate the advantages of the *new* White 3000 as they apply to your exact needs.



SHORTER TURNING RADIUS SAVES MANEUVERING TIME



BETTER CAB ACCESSIBILITY SAVES DRIVER TIME



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White SUPER POWER 3000

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Las Palmas Ave., and will eventually be used to house additional facilities for processing still color films and amateur black-and-white and color motion picture films. The 2-story concrete building has approximately 60,000 square feet of floor space with an adjacent parking area of 45,000 square feet.

M & E FOODS CORPORATION FORMS —M & E Foods Corporation, Puente, forms to take over the specialty packing business of Santa Maria Canning Co., headed by Mario S. Pencin and son.

MONROVIA PLANT FOR CHEM-THERM — Chem-Therm Manufacturing Company of Pasadena, manufacturer of steam cleaners, steam heaters, wash rack equipment and steam cleaning compounds, completes plans for a new $100,000 factory in Monrovia. The new plant will give the company expanded production, increased office space and shipping facilities.

$100,000 ADDITION FOR CUTTER LAB. —Cutter Laboratories, Berkeley, purchases from Pan American Engineering Co. additional warehouse and office space adjoining the present laboratories at a reported cost of $100,000. In addition to 36,000 sq. ft. of floor space, 43,800 sq. ft. of land are included in the purchase. The property is vacant and is expected to be occupied immediately by Cutter.

SHIPYARD LEASES EXTENDED ON NAVY REQUEST—At the U. S. Navy's request, the Los Angeles Harbor Commission extended Todd Shipyards' lease ten years. A large scale Navy and U. S. Maritime Commission shipbuilding program is anticipated to begin soon at Los Angeles Harbor, and the ship construction concern located in Wilmington will operate its facilities for the Navy under present plans. Fifty large cargo vessels are planned by the Maritime Commission, some of which may be built at the Todd yards.

COM-AIR PRODUCTS BUYS BAKEWELL CONCERN — Com-Air Products, Inc., 1201 Rio Vista, Los Angeles 23, purchases the plant equipment and facilities of the Bakewell Products. The corporation will engage in business as a precision machining facility for the aircraft industry, and will continue to operate the business of Bakewell Aircraft Products Company. The internal organization of the company, for the most part, remains unchanged.

PRESERVE CO. CHANGES HANDS—E. A. Wright Company, preservers, changes hands and will now be known as S. T. Romley & Sons, Oakland. S. T. Romley becomes general manager, assisted by his sons Tony, James and George.

NEW COMPANY BUYS SOLAR'S FURNITURE DIVISION—John Hancock Manufacturing Co., a newly formed company, buys the Redwood Products Division of Solar Aircraft Co. and plans to move the furniture operations from the Solar plant to space leased in the former Convair No. 2 plant. The new company plans to continue the former lines of production which include casket shells, crates and shipping boxes, patio and indoor redwood furniture and similar work. The furniture company employs 50 persons and has an annual payroll of around $225,000.

EASTERN FIRM BUYS SAN LEANDRO SITE—Monadnock Mills, a wholly-owned subsidiary of United Carr Fastener Corporation, Cambridge, Mass., purchases a 52,000 sq. ft. building at 1975 First Avenue, San Leandro, at an undisclosed price. Currently located at 901 E. 14th Street, the company expects to move into the new quarters within four weeks after remodeling. J. G. Peterson, vice president and general manager, continues to head the expanding Monadnock Mills operation.

NEW DIVISION FOR GEN. METALS—Under a recent acquisition, Pacific Fittings, Inc., producer of pipe fittings, nipples and pipe couplings, becomes the Pacific Fittings Division of General Metals Corporation. Organized in San Francisco as the Pacific Nipple Company in 1928, this organization has steadily enlarged its operation. Through the affiliation of these two well known Pacific Coast concerns, further improvements and expansion of manufacturing facilities are planned. Pacific Fittings will continue to retain its own identity in serving the Western trade.

PACKING COMPANY BUYS VERNON PROPERTY—The Miliken Packing Company, 4350 Alcoa Avenue, Vernon, purchases two acres of industrial property at the southwest corner of Vernon and Seville Avenues, Vernon. The land is served by the Los Angeles Junction Railway and was purchased from The Harvlan Co. of Los Angeles. No immediate plans have been made for using the property other than as an investment.

BELMONT METAL FIRM EXPANSION —Belmont Engineering Company, 1325 Old County Road, Belmont, plans expansion of production and production facilities. Fol-

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lowing the installation of steel fabricating, iron working and die machinery, the peninsula plant has taken on contracts for the fabrication and manufacture of aggregate bins and conveyors for Seaverns Engineers and Equipment Company.

NEW WAREHOUSE FOR ZURBACH STEEL—Zurbach Steel Co. of California, Inc., begins construction of offices and warehouse at 2055 South Camfield Avenue, Los Angeles, on its newly acquired 2½-acre industrial site from the Union Pacific Railroad. Removal of all facilities currently located at 2830 East Washington Blvd. to the new location is expected around the first of 1951.

PAXTON ENGINEERING CO. TO MOVE—On January 1, 1951, Paxton Engineering Company, division of McCulloch Motors, 11845 Teale Street, Culver City, will move to a new reinforced unit of tilt-up construction at 600 West 98th Street. The new unit, divorced from the manufacturing phase, will greatly expedite the research and experimental work that is now being done on superchargers and portable water pumps.

FENDER WELT—is the latest product to be added to the growing list of parts and equipment manufactured locally for West Coast automobile assembly plants. All Plymouth automobiles assembled in Chrysler Corporation's two California plants will hereafter use a vinyl plastic welt manufactured by Resin Industries, Santa Barbara, under the terms of a contract completed by the two companies. Fender welt previously was shipped to the Coast from Eastern suppliers.

$600,000 EXPANSION FOR SAN ANDREAS PLANT—Calaveras Cement Company plans to expand its San Andreas plant at a cost of approximately $600,000, which will enable the plant to continue at full capacity during the slack winter months, producing large inventories of cement for distribution when demand increases again in the spring. The major part of the new installation is expected to be completed in December and will include installation of additional raw and finish mills, and the construction of four new cement storage silos and four new slurry silos.

GEM WARE MFG. CO. SOLD—Frank E. Gaines purchases Gem Ware Manufacturing Co. of Los Angeles, which firm manufactures magnesium and aluminum castings for industrial users, as well as making cooking ware. Terms of the purchase were not announced but include all physical assets and raw material of Gem, which now will operate at the Gaines Co. However, it will retain the Gem ware trademarks on its cooking ware and other consumer goods. No personnel changes are planned at this time. Gilbert A. Ferlin will continue as plant manager.

MILLION DOLLAR BUILDING PROGRAM FOR NORTH AMERICAN—North American Aviation, 5601 Imperial Highway, Inglewood, plans a new $1,000,000 building program to include a 108,000 sq. ft. fabrication building to house extrusion forming, sheet stretch-forming, and processing work; a 12,800 sq. ft. drop hammer and power hammer building; and a 75,000 sq. ft. addition to the existing warehouse. Completion is planned for May 1951.

NEW CORP. TO BUILD $1,000,000 STEAM PLANT — Canners Cooperative Steam Company, Cannery and Ways Streets, Terminal Island, forms to build a million dollar central steam plant containing four large steam generators, to be used in cooking fish and for other industrial purposes by member companies. The companies financing the plant and operating it jointly are California Marine Curing & Packing Company, French Sardine Company, Van Camp Sea Food Company, South Coast Fisheries, Inc., and Terminal Island Sea Foods, Ltd. Construction will not begin until April 1951.

ZONOLITE MFG. CO. MOVES—Zonolite Manufacturing Company moves from Sacramento to 5440 San Fernando West, Los Angeles. Products processed are plaster and concrete aggregate, high temperature cement, industrial insulation and horticultural vermiculite under the trade names of "Zonolite" and "Terralite."

$1,500,000 EXPANSION FOR DOW CHEMICAL—Dow Chemical Company announces plans for a $1,500,000 expansion program at its Pittsburg plant, with only a slight increase in employment resulting. It is expected the new plant will be in operation before the end of 1951 to meet the increased chemical demands of Pacific Coast industry, as well as strengthen national defense requirements.

$4,000,000 LOCKHEED ORDER—Air France, air transport system, purchases four additional Lockheed Constellations for international service, at a cost of $4,000,000. This is the seventh reorder by Air France and the new planes are scheduled to join its fleet in the summer of 1951.

COLORADO

$26,200,000 PROGRAM FOR CF&I—Approval of a new $26,200,000 modernization and improvement program for Colorado Fuel & Iron Corporation's Minnequa works at Pueblo, by the company's directors has been given. The program includes boosting annual steelmaking capacity at Pueblo by

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325,000 tons to 1,645,000 tons with installation of two new open hearth furnaces and rebuilding the "A" blast furnace. Plans also call for opening a new coal mine in southern Colorado, approximately 27 miles west of Trinidad, to be known as the Allen mine, and the building of a new high-speed modern 10-inch rolling mill.

OIL FIRM TO SPEND $1,000,000 IN JULESBURG BASIN—Ryan Oil Company, Texas, is spending $1,000,000 before January 1, 1951, on leasing and drilling activity in the Julesburg basin in northeastern Colorado, southeastern Wyoming and northwestern Nebraska. A Denver office has been opened by the company. Contracts have been let for drilling six test wells in Logan County, Colorado; Laramie County, Wyoming; and Box Butte, Dawes and Chase Counties, Nebraska, all of which will be close to the $60 million crude oil pipeline planned to run from Worland, Wyoming, to Wood River, Mo.

S. F. OPENS STREAMLINED YARDS AT PUEBLO—The A. T. & S. F. Railway Co. opens its $3,000,000 ultra-modern streamlined "hump" yards at Pueblo, a railroad innovation for speedily handling freight cars. The new system, which includes a new freight depot, yards headquarters and dispatcher's office, operates by loudspeaker system, signals, telephone and walkie-talkie radio. Records are micro-filmed for efficiency and compactness. It dispenses almost entirely with the age-old system of individual car switching by engine and crews.

ARAPAHOE ELECTRIC PLANT OPENS—The $23,000,000 Arapahoe Steam Electric plant opens in Denver at 2601 South River Drive. Two more units of equal size are still to come. 600 persons were employed at the peak of construction, and 500 remain on the project at present. The second 40,000-kilowatt generator is now being installed, and the unit it serves will go into service in January. The third unit will be finished later in 1951. It is anticipated 40,000 new homes in the Denver area will be served by this new plant.

HAWAII

$5,000,000 GENERATOR FOR HECO—Hawaiian Electric Co., Ltd. installs a new $5,000,000 giant steam turbine generator at its Waiau plant, increasing electric power for Honolulu and the island of Oahu by 40,000 kilowatts. This bring's HECO's investment in the Waiau station to an excess of $16,000,000.

IDAHO

TROY BRICK PLANT SOLD—Washington Brick and Lime Co. has purchased the plants and properties of Idaho Fire Brick and Clay Co., Troy. Facilities include 220 acres of high grade clay deposits, a 7½ acre plant area, and a 99-year lease on additional Idaho clay deposits.

STARCH COMPANY OPENS SECOND PLANT—The Idaho Potato Starch Company, Blackfoot, opens a second plant at Idaho Falls with a capacity of 250 bushels per day. New machinery has been installed and plain starch is now being produced, with specialty starch for the manufacture of clothing and the paper industry to follow. 30 men are employed at the plant.

Utah's first electrolytic copper refinery—Kennecott Copper Corporation's new $16,000,000 plant at Garfield (see under "Utah" heading).

NEVADA

BOX FACTORY IN RENO—E. R. Johnson Box Company of Arizona opens a box factory in Reno, planning to use from 75,000 to 80,000 feet of lumber daily from the Vaughn Millwork Company of Reno. Arizona Vegetable & Fruit Growers Association will use the vegetable shook produced by the factory.

NEW MEXICO

URANIUM FIND—A recent discovery of a new uranium field in northern New Mexico promises to be the largest find of A-ore yet made in the nation. Several large mining companies are investigating and studying the field. Two other rich areas of uranium have been located in New Mexico, the exact location to be announced later. Production figures probably will show that New Mexico is leading the nation in perlite output for 1951.

OREGON

SAWMILL COMPANY CHANGES HANDS—Shevlin-Hixon Company sells its entire Bend holdings, including timber, sawmill and logging equipment, to Brooks-Scanlon, Inc., for an undisclosed amount.

BEALE PIPE AND TANK CORPORATION—moves, its plant, shown below, from Portland to St. Johns where purchase has been made of 5 bays formerly used by

New plant for Beale Pipe & Tank Corp.

Oregon Ship Building Corporation. Two bays are 77' wide by 500' long and three are 77' wide by 320' long. The latter bays have an additional 180' of open craneway on each end.

$700,000 PLYWOOD MILL—The new cooperative Astoria Plywood Corporation begins preparation for the site of its proposed new plywood mill at Astoria. The Clatsop mill site was bought from the city for $37,000 and plans are under way for constructing a $700,000 plywood mill on the site.

OPERATION BEGINS FOR COATING FIRM—The Protective Coatings Corporation of Oregon begins operation at 3419 S.W. Moody Avenue, Portland. A full line of roof coatings, aluminum coatings, paints, caulking compounds and waterproofing specialties such as underframe coatings, emulsions and damp proofings will be made at the plant. Manufacturing and sales will be exclusively to the wholesale trade.

GARDINER SITE FOR PLYWOOD PLANT—Long Bell Lumber Company plans to begin construction by January 1951 on a new plywood plant at Gardiner. The new unit will consist of a main building 250 x 500 ft., a power plant and a long pond and will be located on a tract adjoining the company's Gardiner mill. It is expected the new plant will cost several hundred thousand dollars although no estimate of the cost has been announced. Completion is expected in about a year. Ultimately about 200 persons will be employed. Shipment of the logs for the facility will be shipped from Long Bell's Scottsburg plant.

$250,000 FIRE DAMAGE—Fire swept the Heppner Lumber Company's box factory, planer shed and partly completed new planer shed, causing $250,000 damage. Four boxcars of lumber, ready for shipment, also were destroyed. Saved from the flames were the repair shop, dry kiln, sawmill, garage and most of the stacked lumber in the yards. 35 men, working on two shifts, have been idled. Rebuilding is expected.

SALEM FLAX PLANT EXPANSION—At a cost estimated at several hundred thousand dollars, Oregon Flax Textiles plans to expand its Salem branch. One of the main reasons for the expansion is that manufacturing operations at the plant are no longer confined to flax fiber products. Wool has been added and rugs and carpeting from both flax and wool are now being turned out.

EASTERN CONCERN BUYS SUTHERLIN PROPERTY—Sutherlin Timber Products Inc., Sutherlin, sells its property to Empire Millwork Corporation of New York. This is the second Douglas fir sawmill unit acquired by the eastern firm. Operations at Sutherlin will continue under the name of

Sutherlin Timber Products Inc., as heretofore, with D. B. Kesner remaining as resident manager. Transferring from the company's Skykomish operations, Orin Archibald will have charge of logging, succeeding A. J. Standley.

$800,000 EXPANSION PROGRAM FOR M AND M WOOD WORKS—Plans have been made for an $800,000 modernization and expansion program involving major plant facilities of M and M Wood Working Company. The program will include reconstruction and expansion of the Portland saw mill operation; improvements for increased production and improved quality redwood plywood at Eureka, California, plywood plant; a new dry kiln at the Portland Door plant and modernization of other kiln units.

OREGON NICKEL MINING PROPERTY LEASED—The Hanna Development Company, a subsidiary of the M. A. Hanna Company, leases the Oregon Nickel Mining Company property on Nickel Mountain near Riddle, Douglas County. Development work will depend upon results obtained after research on the metallurgy of the ore in Hanna's research laboratory. The Nickel Mountain deposit supposedly contains the largest quantity of nickel in the United States.

UTAH

ELECTROLYTIC COPPER REFINERY—first in Utah, has been completed at Garfield by Utah Copper Division of Kennecott Copper Corp., at a cost of $16,000,000. It provides for the accomplishment of mining, milling, smelting, and refining. After it gets into full operation, it will require 700 persons on the payroll. Initial capacity will be 12,000 tons of refined copper per month, with provision for substantial increase.

$5,000,000 DEVELOPMENT PROGRAM—Byrd-Frost Corp. of Dallas, Texas, begins a half million dollar natural gas exploration and development program in Utah, the first test well being located in southeastern Utah. Gas is being sought in the test for a proposed $25,000,000 line of the Utah Natural Gas Co. from Boundary Buttes, San Juan County, to Salt Lake City.

UTAH EXPLORATION FOR GEN. PETE—General Petroleum Corporation begins work on a new exploratory well in the Green River area in eastern Utah, the estimated cost of the first well being $500,000.

WASHINGTON

HOOKER ELECTROCHEMICAL TO SPEND $2,000,000—Hooker Electrochemical Co. plans to build a $2 million plant at its Tacoma works for the manufacture of anhydrous ammonia. The ammonia output of the plant will be produced for the Pacific Northwest pulp, paper and chemical industries. The new unit is expected to be in production early in 1952.

CO-OP FORMS—Moulded Plywood Inc., a new cooperative concern, forms in Tacoma and acquires the Resinweld Plywood Inc. plant at 2400 Center Street, from Harry G. Wilcox and A. Douglas Myers. The new organization is capitalized at $500,000 and ownership is vested in 120 shareholders. J. C. Lloyd is named general manager.

$300,000 CANNERY AT TERRACE HEIGHTS—Ground is broken for a new $300,000 cannery at Terrace Heights siding, east of Yakima. The new facility will be ready for the initial crop of 1951 (cherries), replacing the leased Sunnside plant which must be vacated prior to March 1951. The new set-up is designed to handle 300,000 cases a year and will have 4 lines for pears, peaches and apricots, with separate facilities for cherries, sliced apples and apple sauce. Walter Kohagen is named manager.

FERRO-ALLOYS COMPANY EXPANDS—Operating a section of the Government's wartime magnesium plant at Mead, near Spokane, Pacific Northwest Alloys Company, a subsidiary of Chromium Mining & Smelting Company, Canada, doubles its production of ferrochrome and ferrosilicon. A third electric furnace was put into operation in August and a fourth in September. Additional allocation of power by the Bonneville Power Administration and the increased demand for ferro-alloys by the steel industry, are responsible for the expansion.

WYOMING

SLICK CREEK OIL FIELD DEVELOPMENT—General Petroleum Corporation launches a $500,000 drilling program to develop its newly discovered Slick Creek oil field in Washakie County. The new field is located in the Big Horn Basin about four miles southeast of Worland. Work has begun on two additional wells, one on either side of the well which brought in the field last September 27th, and each well is expected to cost approximately $250,000.

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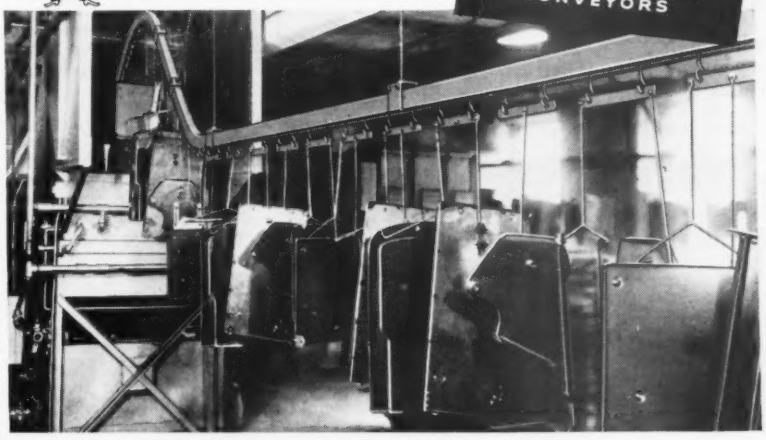

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WESTERNERS AT WORK

Arizona

Kennecott Copper Corporation appoints ABE P. MORRIS assistant to the general manager of its Ray, Arizona, operations. He was formerly superintendent of the corporation's Chino Mines Division at Santa Rita, New Mexico. New Mexico Kennecott appointments include WALTER E. HERKENHOFF as assistant mine superintendent; W. HOWARD WINN, assistant smelter superintendent; KENNETH V. N. HARRIS, general mine foreman; DAN G. THORNE, general maintenance foreman; and REX E. MATTHEWS, chief electrician.

California

United Employers, Inc., 610 16th Street, Oakland, adds LAURENCE P. CORBETT, formerly of Stamford, Conn., as staff counsel, replacing ARTHUR B. JACOBS who has entered private practice.

Western Frontier Engineering and Drydock Company forms and takes possession of the industrial building at 1100 Battery Street, San Francisco, under lease with the

LYNCH

HARDIN

U. S. Navy, and begins production on government orders. It will also serve industry in general. The new company is a California corporation and names J. MARCUS HARDIN, president, WALTER F. LYNCH, vice president and general manager, CARLTON RANK, vice president, and LAWRENCE S. FLETCHER, secretary.

Increased production at San Diego plant of *Solar Aircraft Co.* called for reorganization of the engineering division into two departments. BILL HEATH continues as chief engineer of aircraft products engineering department, assisted by BOB MAGNESS, chief project engineer. PAUL PITT named chief engineer of development engineering department, assisted by assistant chief engineers PHIL WARD and BILL GURNEY.

Trans World Airlines, Los Angeles, appoints ERLE M. CONSTABLE as treasurer, succeeding A. V. LESLIE, vice president and treasurer, resigned.

RICHARD E. WHITE, formerly a Navy commander in charge of the Bureau of Aeronautics' Power Plant Division, appointed chief administrative engineer of the metal products division at *Ryan Aeronautical Company*.

CHARLES D. PERRINE, JR., specialist in missile homing guidance systems, joins the electronics and guidance section of *Consolidated Vultee Aircraft Corp.'s* San Diego division engineering department. Perrine formerly was manager of electronics department of Fairchild Engine & Airplane Corp.'s guided missiles division, Farmingdale, N. Y.

ROBERT S. KIRKSEY, Los Angeles, retires from active duty as vice president of *Fruehauf Trailer Company*. He will continue to serve in advisory capacity and as a member of the board of directors.

DEACON

McCulloch Motors Corporation, Los Angeles, appoints WALTER K. DEACON to its engineering staff. Deacon will be responsible for production engineering on all of the company's products, which include lightweight engine-driven equipment and special target aircraft engines.

Ryan Aeronautical Co., San Diego, promotes BRUCE SMITH to its top engineering post, director of engineering. Smith, formerly chief engineer of the airplane division, had previously been chief design engineer for Consolidated Vultee. Appointed principal aid to Smith is W. T. IMMENSCHUH, executive engineer.

R. J. BLACKINTON, recently appointed resin application engineer of the West Coast Chemicals Division for *General Electric*, will have his headquarters at the Anaheim plant. Prior to joining the GE staff, he was technical director and secretary of the Western States Lacquer Corp. in Los Angeles.

General Petroleum Corporation advances CLAUDE W. PIERCE to a newly-created post of Superintendent of Water Disposal. Pierce has been associated with the company for more than 24 years.

Plomb Tool Company, Los Angeles, elects LAWRENCE M. RICH vice-president.

ARTHUR BAXTER promoted to the newly-created post of director of purchasing at *Hoffman Radio Corp.*, Los Angeles. CHARLES G. LOCKE, formerly with the purchasing department of Bendix Aviation Corp. in North Hollywood, replaces Baxter as purchasing agent. Hoffman also announces that M. W. HORNER will be in charge of production for the special apparatus division.

HARRY SILKE, JR., former assistant director of OPA for Southern California, appointed manager of the Traffic and Transit department of the *Los Angeles Chamber of Commerce*, replacing HOWARD P. MASON, ordered to active navy duty as aviation supply officer of an aircraft service squadron.

HUDSON PHILLIPS named director of public relations for *Consolidated Vultee Aircraft Corp.*, San Diego. Phillips, who has been acting director since mid-June, will continue as an associate with H. A. Bruno and Associates of New York City, public relations counsel for Convair for nearly three years.

PAUL L. DRAGON named manager of *Labor Relations* for the *Operating Department of Columbia Steel Company*, a subsidiary of United States Steel Corporation. Dragon formerly served as assistant director of Industrial Relations of Columbia Steel Company, and prior to that was supervisor of Industrial Relations at Columbia's Pittsburg, California, plant.

WALTER STERLING joins *Cinema Engineering Company*, Burbank, as development engineer. He formerly was with Marquardt Aircraft Co., Point Mugu, California, and also on the naval project at Inyo-Kern, China Lake, Calif.

L. G. SNOW of Los Angeles, formerly oil and gas supervisor for the U. S. Geological Survey, becomes the Secretary of the Interior's representative in matters relating to oil operations in California's tidelands.

KENNETH L. VORE, director of the Transportation Division of Los Angeles Chamber of Commerce, appointed consultant to the director of military traffic service in Washington, D. C., to help develop a unified traffic plan for the nation's defense program. Vore will be consultant to E. G. PLOWMAN, director of the military traffic service, a newly established defense agency.

Manzana Products Co., Sebastopol, applesauce and products packer, names WILLIAM DAVIS as manager succeeding WALTER TISCHER, resigned.

Century Engineers, Los Angeles, appoint ROBERT PARSONS executive vice president. He was formerly sales engineer for aircraft sales division, Firestone Tire & Rubber Company.

Pacific Airmotive Corporation, 2940 North Hollywood Way, Burbank, names LAURANCE H. COOPER consultant to the management. Cooper, formerly vice president and general manager of PAC, established his own consultant service shortly after leaving PAC in June, and now names Marquardt Aircraft, PAC and others as his most recent clients.

Northrop Aircraft, Inc., Hawthorne, appoint GEORGE N. MANGURIAN, nationally-recognized aircraft structures engineer, as chief of structures of its company.

PELTON

Hart Fruit Products Company, Brea, names LOUIS A. PELTON assistant to the president. Pelton formerly was vice president of Pompeiian Olive Oil Corporation, Baltimore, and in the newly-created post will divide his time between the local plant and the company's facilities at Eustis, Florida. He will supervise all promotional and sales activities.

National Motor Bearing Co., Inc., Redwood City, promotes H. K. POHLMAN, former president and general manager of Arrowhead Rubber Company, Downey, to the post of director of manufacturing. Arrowhead Rubber is a subsidiary of N.M.B. In his new capacity, Pohlman will direct

and coordinate manufacturing in all of N.M.B.'s plants and will have his headquarters in the home office at Redwood City. ALVIN C. HEWITT, vice president of Arrowhead, succeeds Pohlman as general manager of the rubber division. Succeeding Hewitt as assistant general manager is CYRUS WINTERSEA, formerly of Cleveland.

GEORGE T. HENCH promoted to the position of executive assistant to the director of *Port of Stockton*. Prior to this appointment, Hench was sales manager of the Port and will continue to handle these duties in combination with his new office.

Solar Aircraft Company, San Diego, returns former Washington, D. C., manager PHILIP L. WARD to its home plant as assistant chief engineer in the company's newly formed Development Engineering Division.

Allied Synthetics Company, San Diego, manufacturer of a synthetic resin-impregnated glass for skylights and partitions, changes its name to *Alsynite Co. of America*. The new name followed a change of ownership in which LOUIS L. POTOMAC became president, and JOHN S. BERKSON, executive vice president. Alsynite is the trade name of the company's product.

WALTER J. HERMANN is the new vice president of *Southern California Gas Co.* He is former vice president of Commonwealth Services, Inc., New York.

BURTON S. GRANT appointed chief engineer of water works and deputy general manager of *Los Angeles City Department of Water and Power* succeeding LAURANCE E. GOIT. Named assistant chief engineer succeeding Grant is SAMUEL B. NELSON.

KRAEMER

Western Transportation Conference, San Francisco, appoints LOUIS S. KRAEMER secretary, succeeding EARL S. WILLIAMS who resigned to organize the proposed traffic department for the State of California.

J. BERT EASLEY appointed treasurer-controller of *Golden State Co., Ltd.*, San Francisco.

PAUL R. HARTIG named manager of the Oakland Transformer plant of *General Electric Company's* Apparatus Department; D. E. MOOREHEAD appointed manager of the San Jose motor plant for the company.

United States Products Corp., San Jose, elects FRED M. DREW president, succeeding the late CARL N. LOVEGREN. In 1945 Drew served as president of the Canners League of California and was formerly president of the Drew Canning Co.

JOHN RAUEN, JR., elected vice president and treasurer of *U. S. Spring & Bumper Co.*, Los Angeles.

F. M. DE CLERCQ named chief airfreight agent for *American Airlines* in the Bay Area, succeeding T. J. GILBRIDE who transfers to a similar post in Los Angeles.

ERNEST EMMRICH, formerly in charge of office and traffic operations in the five central California plants of *Hunt Foods, Inc.*, moves from Hayward to Fullerton to become general traffic manager. Replaces

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RALPH HENDERSON, resigned. HARLOW E. PECK, formerly chief traffic clerk, promoted to assistant traffic manager.

National Supply Co., Torrance, appoints CORBIN H. MYERS, formerly superintendent of the standards department, as superintendent of industrial engineering. DAVID M. SOWLE, formerly employment manager, is the new superintendent of industrial relations.

SOWLE

MYERS

JAMES WHITMORE, former assistant superintendent at *Libby McNeill & Libby's* Gridley plant, succeeds E. R. GREEN, deceased, as superintendent.

WORRELL F. PRUDEN appointed assistant chief engineer of *Columbia Steel Co.*, San Francisco. He was formerly chief engineer of Consolidated Western Steel Corp., a sister U. S. Steel subsidiary. Columbia also announces three appointments on the metallurgical staff. R. A. SCHAUS appointed metallurgical engineer of alloy, stainless and tubular products in the San Francisco office. B. W. BUIST succeeds Schaus as senior service metallurgist in the Southern division, and D. C. WILDE succeeds Buist as service metallurgist.

EDWIN L. OLIVER, JR., newly-elected vice president and member of executive committee of *Oliver United Filters, Inc.*, San Francisco, is in general charge of all company operations, replacing P. A. HOYT, who has been granted six months' leave of absence for health reasons.

Colorado

Fort Morgan Mills, Fort Morgan, names BILL HEISER manager, succeeding HAROLD ROTH. Heiser was former superintendent of Graden Flour Mill Co. in Durango. Roth resigned to accept a position as manager of the Blue J. Feeds, Inc., plant at Gering, Nebraska.

MISS JOSEPHINE ROCHE, coal executive, resigns as president of the *Rocky Mountain Fuel Company* after heading it since 1928, to devote full time to work as public trustee for the United Mine Workers' health and welfare fund in Washington, D. C. ROY ST. LEWIS of Washington, former U. S. assistant attorney general and former U. S. attorney for Oklahoma, succeeds Miss Roche as president. Denver Attorney ANTHONY F. ZARLENGO named to fill the vacancy on the board, and also appointed counsel for the fuel company.

Personnel changes at the wire mill and combustion engineering department of the *CF&I Pueblo steelmills* include: C. C. TAPPERO named superintendent of the wire mill, assisted by MORTON REYNOLDS, from the CF&I Calwico wire mill at South San Francisco; H. W. HODGES becomes superintendent of the newly established combustion engineering department which studies and regulates fuel consumption in all departments of the Pueblo plant.

Idaho

U. S. Atomic Energy Commission, Idaho Operations Office, appoints WILLIAM A. ERICKSON, who is now acting as division chief, assistant division director. WILLIAM L. GINKEL named branch chief, will head the special materials section.

Oregon

J. D. HENDRICKSON, general superintendent of *Columbia River Packers Association, Inc.*, Oregon, promoted to vice president.

NILS G. TEREN elected president of the *Oregon Pulp & Paper Co.*, and *Columbia River Paper Mills*, succeeding ROBERT H. NOYES, retired.

TAYLOR ALEXANDER, associated with *Oregon Pulp & Paper Co.*, *Columbia River Paper Mills* and affiliated companies for the past 25 years, resigns as vice president and director. He has announced no plans for future connections in the lumber trade.

MALARKEY

THOMAS B. MALARKEY, formerly executive vice president, elected president of *M and M Wood Working Company*, Portland. Malarkey has served as chief executive of the plywood and door company since the retirement of former president HERBERT MALARKEY last April, and began his association with M and M in 1936.

Personnel changes at *R. M. Wade & Co.*, Portland, include: WARREN FORSYTH, former sales manager of the Wade industrial pump division, appointed assistant manager of the Multnomah Iron Works, manufacturing division of R. M. Wade & Co. WILLIAM NEPOTE, former industrial sales representative of the company, advances to sales manager of the pump division. Appointed to fill Nepote's former position of sales representative is AL YOUNGBLOOD who recently joined the organization.

Diamond Lumber Co., Glenwood, appoints LESTER YOUNG production manager, and WILLIAM C. LAMBDIN, formerly of Siuslaw Forest Products, Inc., Mapleton, head of sales department housed in a new office building at Tillamook. Planing and remanufacturing facilities are also located at Tillamook.

Utah

KARL H. KOROPP, recently returned from Peru, named assistant superintendent of the new electrolytic refinery of the Utah Copper Division of *Kennecott Copper Corporation* at Garfield.

GEORGE S. LAMSON, manager of the automotive replacement division for the *Thermoid Co.*, advances to post of vice president.

Washington

W. G. REED, president of Simpson Logging Co., Seattle, elected chairman of the executive committee and executive vice president of *Rayonier, Inc.*, Port Angeles. Pending the selection of a president, Mr. Reed will be the chief operating executive and will establish his office in New York in order to devote his entire time to the affairs of the company. Personnel changes at *Rayonier, Inc.*, include: HARRY A. THURLOW, resident engineer becomes assistant resident manager; BRYAN L. RAUSCHERT promoted from assistant to resident engineer; and DONALD E. LAWSON, previously shift superintendent, named new assistant resident engineer.

ROBERT S. MACFARLANE succeeds C. E. DENNEY as president of the *Northern Pacific* railway on January 1. Macfarlane joined the company in 1934 and has served as executive vice president since 1947, with headquarters in Seattle. In January 1950 he transferred to St. Paul. He is a past president of the Seattle Chamber of Commerce.

T. B. HARGREAVES, assistant manager of *Crown Zellerbach Corporation's* Port Angeles mill, named resident construction engineer. HOWARD SIMONS appointed consulting engineer.

R. F. PLYMIRE, former assistant to executive vice president of *Puget Sound Power & Light Co.*, promoted to general commercial manager. H. CECIL WEBB, vice president, resigns to accept a position as general sales manager for Oklahoma Natural Gas Co.

PRESLEY LANCASTER, JR., former manager of Santa Barbara Chamber of Commerce, becomes manager of the industrial department, *Seattle Chamber of Commerce*, with objective of bringing in new industries. JAMES E. LOUTTIT, formerly in charge of this department, heads newly-created manufacturers' division of the chamber.

DONALD E. JOURNEY, Centennial Feed salesman, becomes manager of *Centennial Flouring Mills Company's* Granger mill, succeeding MERWIN O. WILCOXEN, who leaves the company to engage in business for himself in the Seattle area.

MOFFITT

THOMAS E. MOFFITT, appointed assistant works manager of the Tacoma plant of *Hooker Electrochemical Co.* of Niagara, Falls, N. Y. He was affiliated with the company as a sales manager from 1930 to 1945, and has since been employed by Weyerhaeuser Timber Co. and Pennsylvania Salt Manufacturing Co.

CHARLES D. THURMOND named assistant development director of Western division of *Monsanto Chemical Co.*, with headquarters in Seattle.

T. S. HODGINS, Seattle, manager of *Reichhold Chemicals, Inc.* Pacific Northwest division, elected vice president.

Wyoming

E. H. BAILEY of Cheyenne, superintendent of the Wyoming division of the *Union Pacific* railroad, becomes general superintendent of the company's eastern district, succeeding V. W. SMITH, now on special assignment with the labor relations board in Chicago. Bailey will continue to make his headquarters in Cheyenne. C. J. COLOMBO, assistant superintendent of the Wyoming division at Green River, moves to Cheyenne to succeed Bailey. O. A. DURANT, trainmaster at Ogden, replaces Colombo, and B. J. COLLIN of Nampa, Idaho, succeeds Durant.

Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

Cleveland Tramrail California Co., General Conveyor, Inc., 4700 District Blvd., Los Angeles, appointed Los Angeles representative for Cleveland Tramrail. This Los Angeles firm is the same one that also represents Cleveland Tramrail in the San Francisco area, where they were known as Tramrail Engineering, Inc. San Francisco office of Cleveland Tramrail California Co., General Conveyor, Inc., has moved to 503 Market St., San Francisco 5.

ROBERT BOEHM-MYRO, formerly active in industrial work in England, has opened a creating design and packaging studio at 2149 California Street, San Francisco.

George M. Prescott Company, 1567 East 25th St., Los Angeles 11, engineering, manufacturing and distributing firm for materials handling equipment, has formed a close-knit Western dealer organization to handle their various lines for distribution as well as the Dreadnaught line of equipment they are now manufacturing in a newly-constructed building adjacent to their present headquarters. Dealers for this equipment include: *The Norwes Co.*, Dexter Norton Bldg., Seattle, Washington; *Sheniman Paper Co.*, Indio, Calif.; *E. C. Buehrer Associates, Inc.*, 527 Folsom St., San Francisco; *Elliott Mfg. Co.*, 1735 Ventura Blvd., Fresno, Calif.; *Industrial Products*, 436 State St., Santa Barbara, Calif.; *Valley Handling Equipment Co.*, 717 Broadway, Fresno, Calif.; and *Winn Supply Co.*, 256 Seventh St., San Diego, Calif.

David Round & Son, Cleveland, Ohio, appoint R. R. LANCASTER, sales representative, in Salt Lake City and Denver.

ELMER M. HANSON, former sales manager of the Eastern division of *Pacific Airmotive Corporation*, transfers to the sales department of the Burbank office located at 2940 North Hollywood Way.

Pennsylvania Salt Manufacturing Company opens a new sales office in the Woolsey Building, 2168 Shattuck Avenue, Berkeley. Making their headquarters at the new office will be R. A. SNYDER, who will do technical sales service work for metal and maintenance cleaners in industries of California, and J. CAMERON SIDDALL, who will handle

SNYDER

SIDDALL

technical sales and service for agriculture in California, Arizona and New Mexico. Snyder joined Pennsalt in 1946 and previous to his new appointment was active in the Heavy Chemicals Sales Department with Pennsalt, Tacoma, Washington. Siddall was manager of Pennsalt's Washington's Southwestern Division in Bryan, Texas, before coming to California, and will temporarily direct activities of that sales office in addition to his new assignment.

New showrooms and plant, shown below, have been completed recently for *Hayward Equipment Company*, a subsidiary of Hayward Lumber & Investment Co. The new, modern building is located at 410 San Fernando Road, Los Angeles. Hayward Equipment Company was appointed distributor for *Case Industrial Tractors* in Southern California. A complete line of tractors and allied equipment is now on display. Other nationally known construction equipment will be added to the Hayward lines in the near future.

Hayward's new plant and showrooms

David H. Ross Co., San Francisco, appointed northern California representative for *Cinema Engineering Co.*, Burbank, Calif., makers of resistors and other electronic items.

A. R. Maas Chemical Company, Division of Victor Chemical Works, appoints HAL NOELCK to their sales department. Prior to assuming his new position, Noelck was with the Victor Chemical Works where, since 1936, he was in the home office laboratory in Chicago and at their Mount Pleasant, Tennessee plant. Noelck may be addressed at the South Gate, California, plant.

NOELCK

Los Angeles office of *American Wheelabrator & Equipment Co.*, formerly at 5225 Wilshire Blvd., is now located at 2856 Leonis Blvd. New phone is LUcas 5465.

American Pulley Co., Philadelphia, announces appointment of JAMES O. SMITH as Los Angeles district representative. Smith will cover Southern California and the states of Arizona and New Mexico. American Pulley also announces appointment of several new Western distributors for its

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equipment. Handling American Power Transmission equipment is *Northwest Chains & Sprockets, Inc.*, Portland and Seattle. Representing American Materials Handling equipment are *R. H. Brown Co.* of Portland, *Pacific & Western Industrial Supply Co.* of Grand Junction, Colo., *Roll Rite Corp.* of Oakland, and *Yaeger Truck Exchange* of Los Angeles.

Wyandotte Chemicals Corp. promote FRED M. KING, Seattle district manager, to a home office executive post at Wyandotte, Mich. LARRY A. WAGNER, supervisor of sales and service at Spokane, becomes Seattle district manager.

HINMAN

Western Gear Works appoints RONALD C. HINMAN to the position of sales engineer, assigned to the aircraft industry activities of the company. Prior to joining Western Gear, Hinman was associated with United Aircraft Products and Consolidated Vultee Aircraft of Downey. His office will be at the Lynwood plant.

Union Oil Co. of Calif., appoints W. L. SPENCER manager of refinery sales.

Ducommon Metals & Supply Co., Los Angeles, elect three vice presidents to deal with problems attendant to the defense program. A. W. LOHN handles finance; WAYNE RISING handles merchandising, and RUSSELL RISING has charge of sales.

BAKER

Stanley Electric Tools, New Britain, Conn., appoints GAITHER E. BAKER as sales representative working out of the Los Angeles office located at 108 West Sixth Street.

Mallinckrodt Chemical Works, St. Louis, leases a new 30,000 sq. ft. warehouse building being built for them in Los Angeles by Pacific Mutual Life Insurance Co. This West coast distribution center is expected to open in February, 1951.

Bemis Bros. Bag Co. transfers ALLEN T. WEBB from the Memphis, Tennessee, plant to the Portland territory. Webb will handle the territory formerly under TOM BLACKALLER, transferred to the Seattle office. Webb's area will include Portland, the lower Columbia river, and east of Portland to Baker.

Alden Equipment Co., 2336 E. 52nd Street, Los Angeles 58, Calif., forms and will represent the lines formerly handled by the *Snyder Engineering Corporation*, including *The Jeffrey Manufacturing Company* of Columbus, Ohio; the *Cleveland Worm & Gear Company* of Cleveland, Ohio; the *Farval Corporation* of Cleveland, Ohio, and the *Louden Machinery Company* of Fairfield, Iowa. Associated with J. ALDEN LANE in servicing these accounts will be CLARENCE O'BRIEN, TOM COSTELLO and FRANK ALCOCK. The Snyder Engineering Company will continue with engineering, fabrication and construction activities, but will no longer act as manufacturers' agents or distributors.

Barrett-Cravens Company appoints *Materials Handling Equipment Co., Inc.*, 1437 Elliott Avenue West, Seattle 99, Wash., exclusive distributors in the Washington area beginning January 1, 1951. Stocks will be carried at the Seattle plant. Metzgar conveyors; Saginaw products which include casters, conveyor rollers and parts, trolleys, and pneumatic industrial wheels and tires, will also be handled.

Vitramon, Inc., Stepney, Conn., makers of a precision capacitor line, appoint *G. S. Marshall Co.*, Pasadena, Calif., to represent it in New Mexico, Arizona and California.

Southwestern Industrial Electronics Co., Houston, Texas, makers of laboratory test equipment, appoint *Carl A. Stone Associates*, Los Angeles, its representative in Arizona, New Mexico and California.

J. T. Hill Sales Co., Los Angeles, factory representative in Southern California for Chicago Transformer Co., appoint *Radio Product Sales Co.*, Los Angeles, as local distributor.

Kay Electric Co., Pine Brook, N. J., makers of instruments for video and microwave applications, appoints *Gerald B. Miller Co.*, Hollywood, its West Coast representative.

Thomas Skinner Steel Products Co., 1124 E. 23rd Street, Indianapolis 5, Ind., appoints *Gerald P. Miller Co.*, Hollywood engineers, to represent it in California, Arizona and New Mexico.

RICH

Plomb Tool Company, Los Angeles, appoints LAWRENCE M. RICH vice-president and general sales manager. In his new capacity, Rich directs all sales and related activities for PROTO tools. He also supervises the sales operations of the company's subsidiaries.

The *Logansport Machine Company* appoints *The John F. Gertz Co.*, 801 34th Avenue, Seattle 22, Washington, its exclusive representative. Gertz, having been located at the factory for nine years, is qualified to offer a complete sales and engineering service pertaining to the complete line of valves, cylinders, presses and many other items, both air and hydraulically operated, manufactured by The Logan Machine.

RAY A. BURT named Pacific Coast district sales manager of the Ramapo Ajax division of *American Brake Shoe Co.*, with headquarters in Los Angeles.

Yardley Plastics Corporation, Columbus, Ohio, appoints *Fredrick E. Becker & Associates*, 1132 N.W. Glisan, Portland, its distributor for Oregon, Washington and Idaho.

LESLIE M. BYARS, formerly operating *Modern Handling Equipment Co.*, Los Angeles, has dissolved the company and has been appointed exclusive Southern California factory representative for the *Clark*

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All Steel Welded Truck Corp. of Rockford, Ill. Byars will maintain offices at 714 W. Olympic Boulevard, Los Angeles 15. Telephone number RIchmond 5345.

Magic Valley Processing Company, Twin Falls, Idaho, appoint *Morningstar, Nicol, Inc.,* 630 West 51st Street, New York 18, exclusive sales agents.

TURNER

WILLIAM J. TURNER, JR., joins the organization of *Alfred I. Stuart and Associates, Inc.,* Portland, Oregon, as engineer. Prior to December 1, the firm was known as *Alfred I. Stuart, Industrial Consultant.* Before assuming his new position, Turner was associated with the Oregon Steel Mills.

Oakite technical service representatives from the Pacific Coast attended a series of technical-sales meetings at the Roosevelt Hotel, Hollywood, November 16-18, by the *Oakite Products, Inc.* The meetings were in the nature of a general sales and technical review, embodying round-table discussions on new material and servicing methods designed to save time and work on a wide range of industrial cleaning and associated tasks.

Dillon Stevens & Co., Los Angeles, appointed Western representative for (1) *Trimont Manufacturing Co.,* Boston, Mass., manufacturer of pipe wrenches and pipe tools, and (2) *P. A. Sturtevant Co.,* Chicago, Ill., manufacturer of torque wrenches. Territory served includes Washington, Oregon, California, Phoenix and Tucson, Arizona, Las Vegas and Reno, Nevada, Hawaii, and Alaska.

Black & Decker Mfg. Co. recently held a regional sales meeting at their branch office in San Francisco. ROBERT BLACK, vice-president and general sales manager, and GLEN H. TRESLAR, vice-president and sales manager, attended the meeting. Regional sales managers T. H. LUND, Seattle, W. E. BAIR, Los Angeles, and ARTHUR BOEHM, San Francisco, were in attendance. Also 17 salesmen were present from all territories.

E. M. SCHULTHEIS, executive vice-president of *Clark Equipment Company,* was a recent visitor to the West Coast. While in the Bay Area, he made his headquarters with the *E. E. Richter Company* of Oakland, Clark distributors.

The *Belilove Co.,* engineers, 420 Market St., San Francisco, appointed Northern California representative for *Fenwal, Inc.,* Ashland, Mass., manufacturers of the Fenwal Thermoswitch, Detect-a-fire, and related temperature control and detection systems. S. BELILOVE, who organized the company in January, 1950, was chief application engineer and later manager of sales of stationary diesel engines for the Enterprise Engine Co. of San Francisco. In addition to Fenwal, the new firm also represents *Columbia Electric Manufacturing Co.* of Cleveland, *Cole Instrument Co.* of Los Angeles, and the Gas Turbine Supercharger Division of *Brown Boveri Corp.* of Baden, Switzerland.

Wendt-Sonis Company appoints *Industrial Tool & Supply Company,* 1790 Monterey Road, San Jose, Calif., exclusive jobber in that area. The owners of Industrial Tool, DICK ANDREWS and ROD MINDLING, sold these products in Detroit for a number of years before establishing themselves in the San Jose area.

Minneapolis-Honeywell Regulator Co., has set up an independent field organization for its valve division. The Mountain, North Coast, and Pacific regions will be managed by W. A. CLEMENTS, with Los Angeles headquarters. R. R. SCOTT will handle the Northwest region.

Dow Chemical Company, Midland, Michigan, names LELAND A. DOAN, Western sales manager of its Great Western Division, succeeding J. F. SMITH. Smith requested he be relieved of his responsibilities after 22 years' service as sales manager and has now been assigned other administrative duties. Doan joined the Dow organization in 1941 and was manager of the Los Angeles office from 1945 until early this year, when he was promoted to assistant sales manager and transferred to San Francisco.

SHEERE

A. M. Byers Co., Pittsburgh, Pa., wrought-iron manufacturer, appoints A. D. SHEERE as manager of its San Francisco division. He succeeds P. D. TABLER, retired. Sheere, who joined the Byers firm in 1924, was formerly manager of the Houston division.

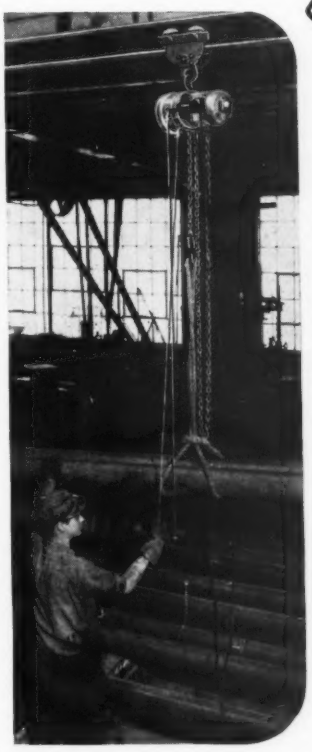
CARLTON R. BECKER appointed western factory representative for *Morse Chain Co.,* division of *Borg-Warner Corp.* Becker will supervise sales of Morse mechanical power transmission products in the eleven states West of and including Montana, Wyoming, Colorado, and New Mexico. Becker's headquarters are at 1571 Harding Ave., Pasadena 7, Calif.

STRINGFELLOW

L. H. (LUKE) STRINGFELLOW, for the past seven years a salesman for *Reliance Steel Company,* 2068 E. 37th Street, Los Angeles, upped to sales manager.

W. D. ARCHER, who has purchased an interest in *Foulger Equipment Co.,* 1361 S. 2nd West, Salt Lake City, assumes the position of vice president. He will act as a general sales representative in addition to fulfilling his administrative tasks. Foulger represents the following companies: *Blaw-Knox Co., William Bros Boiler & Mfg., Diamond Iron Works, Inc., Electric Steel Foundry, Huber Mfg. Co., Joy Mfg. Co., Lima-Hamilton Corp., Marlow Pumps, Marmon-Herrington Co., Pacific Wire Rope Co., Southwest Welding & Mfg., Wayne Crane Co.,* and *Woolridge Mfg. Co.*

NEAL S. MACE appointed Northwestern States manager for *Hunt Foods, Inc.,* with headquarters in Puyallup, Wash. Assisting him is CHARLES WILFORD, who has advanced from a supervisory post.



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Make tough lifting jobs safe and easy. Increase both manpower and output *without adding more men*—put Coffing Quik-Lift hoists on the job. Sensitive control permits fraction-of-inch accuracy . . . to speed handling, cut idle machine time. Up to 49-ft.-per-min. lifting speeds.

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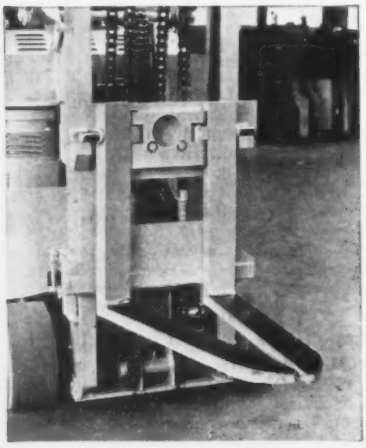
FOR YOUR CONVENIENCE . . .
Use postage-paid card to obtain further information on products mentioned on these pages and literature listed on following pages . . .

E-12501

Power Truck Has Hinged Platform

Features claimed: Platform length on power industrial truck can be reduced almost 50%, so that truck can be transported in small elevators. Overall length of truck with platform in load-carrying position is 109 in.,



and with the forward end of platform raised, the length is 84 in. The apron type platform is hinged at a line midway of its length. The first half is secured in the usual manner to the truck's elevating mechanism. The outer half in lowered position rests upon a forward part of the platform underframe. The two platform sections are joined by specially designed hinges which assure positive alignment and security for truck and load. It is necessary to lift only the outer section into raised position for transporting in elevators and other narrow quarters.

Manufacturer: Elwell-Parker Electric. Co.

E-12502

New Tools Deburr Smaller Size Holes

Features claimed: These are tools of smaller pilot size for deburring and chamfering holes as small as 1/8 in. They are available for fast, efficient deburring on 1/8 in., 5/32 in., 3/16 in., and .189 in. holes. Series DS tools operate in any drill press or power spindle as do the larger tools. A free wheeling knurled sleeve is actuated by the operator—while the spindle continues to rotate—to project the cutting blade to working position and to retract it within the diameter of the pilot shaft. This enables the cutter head to be brought into otherwise inaccessible areas of multi-walled parts.

Manufacturer: Nobur Manufacturing Co.

E-12503

Rack Conveyor Geared to Fast-moving Plant Setup

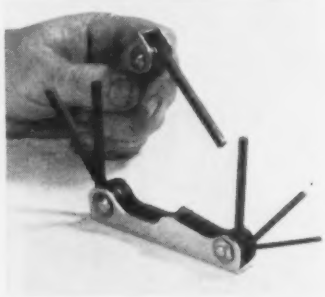
Features claimed: Adjustable peg rack conveyor is designed for handling and protection of machine or polished parts. Conveyor brings machine operator his work properly positioned for fast handling. Adjustable pegs on this easily maneuvered wagon permit handling parts of practically any size, shape, or weight. Vertical construction eases floor congestion and rates high in prevention of accidents.

Manufacturer: Rack Engineering Co.

E-12504

5-in-1 Tool for Socket Head Screws and Bolts

Features claimed: Here is "Smitty," a single tool that fits all the popular



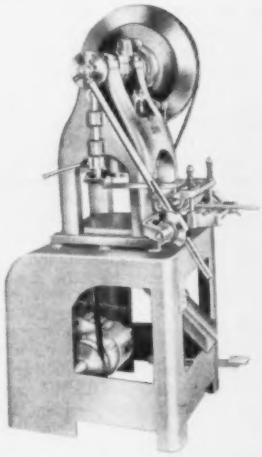
size socket screws and bolts. Tool has five socket-head wrenches that fold into a single sturdy handle. Small enough to fit into a pocket, yet unique design allows plenty of leverage. Tool built for easy access to the most difficult places. When no longer possible to grind the individual wrenches, they can be easily and quickly replaced by removing the end bolt and inserting a new wrench of the same size. No need to buy a new tool. A natural for mechanics, maintenance men, etc.

Manufacturer: H. D. Hunter Co.

E-12505

8-ton Addition to Line of Automatic High-Speed Presses

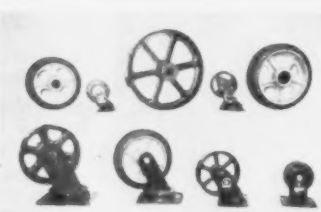
Features claimed: The 8-ton Diebel high-speed automatic press is an eco-



nomical machine for handling work not requiring heavy tonnage. It features a cylinder type ram which slides in an adjustable bronze sleeve, assuring accuracy and longer life. Ram is a 5-in. diam. ground cylinder with split clamp to accommodate 1-9/16-in. diam. x 2 1/8-in. long die shank. A variable speed drive allows operator to select any speed from 110 to 350 strokes per minute. Company also manufactures a 5-ton and 12-ton press in this line.

Manufacturer: Di Machine Corp., Chicago, Ill.

COMPLETE STOCK OF WHEELS and CASTERS
All Sizes, Types and Capacities for Quick Delivery
LARGE LOCAL STOCK



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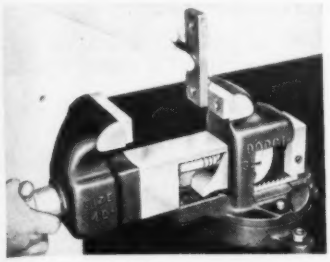
E-12506

Machinists' Timesaver

Features claimed: A new quick-action vise that opens or closes to any position in one second through a push-pull action that eliminates spinning the handle. Built in 4" size only, weighs 58 pounds. Provided with swivel or stationary base. Slide action is simple, fast, positive. Turn the handle 1½ times counter-clockwise and the jaw slides in "neutral" to any position. One turn clockwise and the work is held in position. Once the work is engaged, this vise operates conventionally. No-pinch handle prevents blood-blisters on your hand.



Manufacturer: Dodge Manufacturing Corp.

E-12507

Mass Produce Small Plastic Parts

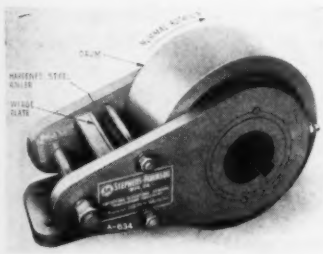
Features claimed: A semi-automatic press, known as Model H-200, with 2 oz. capacity, molds practically all thermoplastics including nylon. A job can be set up by one man in 20 minutes. Operating costs for 8 hours do not exceed one dollar. Push button controlled for ease in hand setup or automatic use. Maximum mold size is 10"; has capacity of plasticizing 12 lbs. per hour in 2-oz. shots, at the rate of 6 operating cycles per minute. 220/440 volt, 60 cycle, 3 phase, AC motor.

Manufacturer: Van Dorn Iron Works Co.

E-12508

Hill-Holder for Conveyor Systems

Features claimed: This holdback is designed to prevent reversal of inclined conveyors and bucket elevators when power is interrupted. A hardened steel roller floats between a wedge plate and a drum keyed to the head shaft. When the direction of rotation of the head shaft starts to reverse, due to power failure, the hardened steel roller is immediately wedged between the drum and the plate, stopping motion gently and without shock. When power is re-applied, the holdback releases immediately. This roller-type holdback is more positive than the ratchet type, which necessarily allows some back travel.



Manufacturer: Stephens-Adamson Mfg. Co.

E-12509

Electronic Device Improves Machine, Worker Efficiency

Features claimed: A new hygrometer that does not use human hair. It makes use of gold leaf and a chemical salt solution that eliminates cleaning and other maintenance. It provides for direct relative humidity reading without assistance of psychrometric charts. It senses changes between limits of 20% and 93% relative humidity. It has minimum span of 20% relative humidity throughout its 20% to 93% range, and the availability of all ranges with full temperature compensation between limits of 50° to

FOR AIR-OPERATED TOOLS AND MACHINERY

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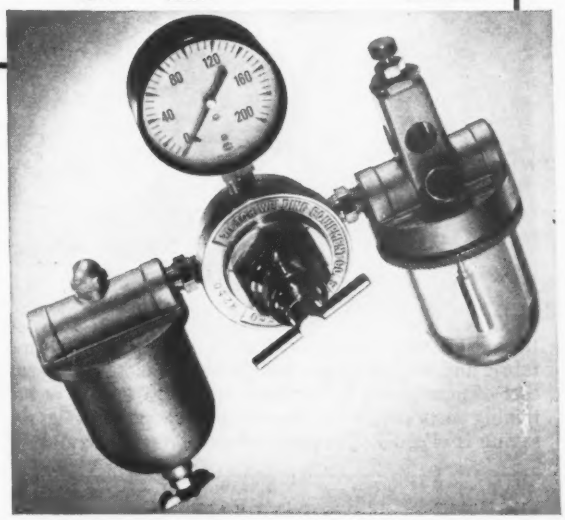

TRAPS Condensation, Keeps Water and Dirt Out of Airlines. No Shutdowns While You Add Oil!

FILTER . . . VICTOR'S scientifically designed filter utilizes an oilite bronze filter unit to trap dirt, pipe scale and condensation, assuring you of pure, clean air.

REGULATOR . . . This regulator is completely newly designed for intermittent air operated tools and machinery. A newly developed seat and nozzle unit (Pat. Applied For) reduced maintenance costs to an absolute minimum.

LUBRICATOR . . . A visual sight feed lubricator that can be set instantly to any desired rate of lubrication. The lubricator is so designed that it cannot become air locked, resulting in an accurate and constant lubrication rate. The clear plastic oil cup can be removed for cleaning by hand, without tools, by merely removing the oil fill plug and the oil cup nut. There need be no interruption of air flow to machinery or tools during this operation.

MODELS

Model FLR-250 . . . . . ¼"-18NPT Inlet and Outlet (Flow Left to Right)
Model FLR-375 . . . . . ⅜"-18NPT Inlet and Outlet (Flow Left to Right)
For Right to Left Hand Inlet, Add "R" to These Model Numbers.

VICTOR *Welding and Cutting Equipment since 1910*

Welding rod for all uses. Regulators for all gases up to 5,000 psi. Machine and hand torches for welding, preheating, cutting, flame hardening and descaling. Portable flame cutting machines. Kinmont power positioners. Fluxes. Write today for free descriptive literature.

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120° F. It will operate remotely over distances up to 1,000 ft. Calibrated to plus or minus 1% accuracy. No moving parts in the sensing element or amplifier. Impervious to dust, dirt, feathers, etc.

Manufacturer: Minneapolis-Honeywell Regulator Co., Brown Industrial Div.

E-125010

Rejuvenate Wornout Industrial Gloves

Features claimed: A new work glove reconditioning service available nationally allows most gloves, thrown away until now, to be reused. Service includes complete renovation, sanitizing, and packaging of all types of worn-out fabric and leather gloves and protective clothing. Because cost of new gloves is increasing about 15%, and reconditioning costs only a fraction of the new retail price, a big saving is effected. Company offers convenient transportation, at no additional expense, in all industrial areas. Fireproof containers furnished, if desired.

Manufacturer: U. S. Industrial Glove Corp., Detroit, Mich.

E-125011

Noise Filters To Save Your Eardrums

Features claimed: A precision built mechanical ear protector that fits comfortably into your ear canal. Has no additional or dependent parts such as wires or batteries. This is not a valve nor an ear plug. It is a sonic filter. It stops loud sudden noises from reaching your ear drum, yet admits conversational tones and sounds of normal voice level. Actuated by pressure changes. Fully automatic in operation, requires no adjustment. Known as the Lee Ear-Valv.

Manufacturer: Sigma Sales Corp.

E-125012

Woodworking Jointer

Features claimed: A 6″ jointer with tables 60″ overall that can be rolled up or down to desired setting instantly. Balanced 3-knife head 2⅞″ dia. is used at 6,000 rpm., 18,000 cuts per min. Fence is 37″ x 4″, and tilts 45°. It may be set at a 7° angle across the cutter head. Rabbeting

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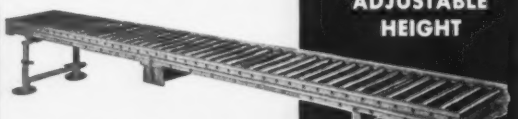
METZGAR "LIVE ROLLER" POWER UNIT

4 STANDARD SIZES

ADJUSTABLE HEIGHT

Handles the jobs that are too "tough" for powered belt units. Undamaged by sharp corners or rough edged work. Supplies dependable power in gravity lines.

Work can be slowed or held without stopping conveyor.



STANDARD WIDTHS 11½″; 15″, 18″; 24″

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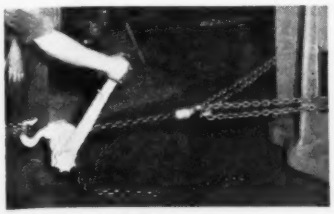
capacity is 5/8" with a rabbeting arm support 1½" long extending 3" from the bed.

Manufacturer: Heston & Anderson.

E-125013

Handy Portable Muscle

Features claimed: Pul-Lift is a new chain model device for hoisting or pulling objects easily. Simple to operate as a wrench, light weight. At any point of the lifting action, load is safely supported by positive, self-actuating load brake. Bottom hook is ball bearing mounted for swiveling. Available in ¾, 1½, and 3 ton capacities.



Manufacturer: Yale & Towne Mfg. Co.

E-125014

Miniature Helipot

Features claimed: Miniature 10-turn Helipot Potentiometer that takes no more panel space than a copper penny. Has a wire wound resistance element 18" long, contained in a ¾" dia. case. Available from stock, also in special resistance values from 100 to 50,000 ohms with accuracies plus or minus .5%, and also plus or minus .1%. Power rating is 2 watts. Net wt. less than 1 oz. Double shaft extensions may be provided, as may welded tap connections at almost any points on the coils. Bulletin 108 contains complete details.

Manufacturer: The Helipot Corp.

REALOCK

PROTECTION PLUS

▶ All fittings, hinges and locking devices have bolts *on the inside,* secure from tampering.

▶ Heavily galvanized by a special process, Realock Fence is weather-resistant, extra strong and durable...costs little or nothing for maintenance.

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THE CALIFORNIA WIRE CLOTH CORP. 1080 - 19th Avenue, Oakland 6, California
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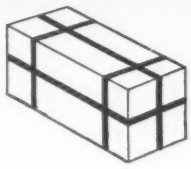
Prior to the introduction of Signode steel strapping, this company's product was laboriously and expensively crated. Today, a lightweight, easily handled container, simply secured with strong Signode steel strapping, does the job better — with important reductions in labor, material and shipping costs.

Of course your product may have nothing in common with a trailer. But the basic principles involved here... the multiple benefits inherent in steel strapping can be just as readily applied—often with equal or superior benefits. For further information, fill out coupon and mail today.



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E-125015

These Rotary Drill Bits Are Extra Short

Features claimed: A new line of concrete drill bits, known as Stubbies, is especially designed for drilling holes for shields and anchors in concrete and

masonry. Because of the use of WI-CTU inserts (cintered tungsten-titanium carbide for longer wear and abrasive resistance) incorporated in these bits, they penetrate concrete and masonry at high speeds and require less pressure. Bits have overall length of 4 in., and come in sizes for drilling holes from ¼ in. to ⅞ in. in diameter and in increments of 1/16 in. They have shank diameters of ¼ in. to ½ in., and may be used in electric drills, air motors or in a hand brace.

Manufacturer: Concrete Termite Drill Co.

E-125016

Demountable Cushion-style Tires on Fork Trucks

Features claimed: This tire is now standard equipment on the Clark Gas Trucloader fork-lift truck in both the 1015 and 1024 models, on the electric battery-powered Trucloader 1024, and the Clarkette-5 towing tractor. Tire features a tapered hard-rubber base reinforced with bead wires. It can be applied to a tapered base wheel merely by bolting together the two wheel halves with a standard wrench found in any tool kit. An Allen wrench is used to remove plugs. Mechanics totally unfamiliar with the new demountable cushion-style tires can remove a used set and mount a new set in 15 min.

Manufacturer: Clark Equipment Co., Industrial Truck Division.

E-125017

Amazing Mower Mounted on Mighty Mouse Tractor

Features claimed: Mott hammer knife mower cuts, shreds, and spreads the material evenly over the ground, making a fine mulch which will retain moisture. One cut through heaviest of grass or brush will leave a smooth surface of any desired height. Design principle consists of hinged knives whirling with centrifugal force from a center shaft, which gives long cutting life at small upkeep cost.

Manufacturer: Mead Specialties Co.

E-125018

No Complicated Controls on Variable Speed Drive

Features claimed: Specon #00ED Drive (½ hp. in non-reversing, 1/3 hp. in reversing model) makes use of a unique motor generator combination. Unit consists of a standard AC squirrel cage motor, 2 standard DC motors and a differential gear box. AC motor is coupled with two DC motors through the differential gear box. DC motors are connected in a closed loop and require no outside DC source of power. Minimum output speed is zero, but maximum torque is obtained at zero speed with gradual decrease as the output speed increases. until at rated speed torque assumes rated value.

Manufacturer: Speed Control Corp.

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Perhaps our modern facilities and capable personnel can deliver values you are seeking, such as:

- WHEELS, HUBS, SPINDLES & AXLES
- COMPLETE & SUB-ASSEMBLIES
- STAMPINGS
- MACHINING
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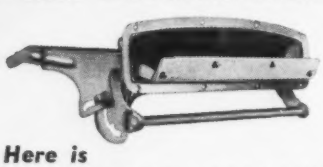
for Example

LIGHT GAGE MANUFACTURE



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We Invite Your Inquiries

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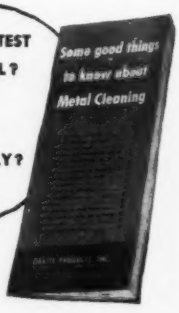
FRENCH & HECHT DIVISION
KELSEY-HAYES WHEEL COMPANY

32 East River Street, DAVENPORT, IOWA

WHAT'S THE FASTEST WAY TO CLEAN METAL? See page 11

WHAT'S THE MOST ECONOMICAL WAY? See page 9



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"Some good things to know about Metal Cleaning"

answers many questions that mean better production, more profit for you. Just look at the table of contents:

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- Machine cleaning methods
- Electrocleaning steel
- Electrocleaning nonferrous metals
- Pickling, deoxidizing, bright dipping
- Pre-paint treatment in machines, in tanks and by hand
- Paint-stripping
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- Treating water in paint spray booths
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FREE For this 44-page illustrated booklet, write Oakite Products, Inc., 1001 E. First St., Los Angeles, or 681 Market St., San Francisco, Calif.

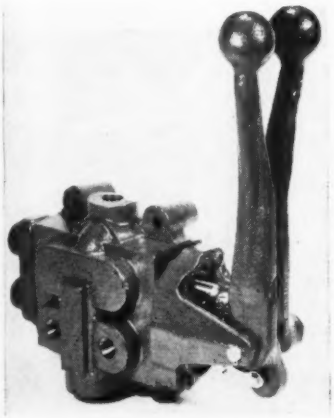
Technical Service Representatives in Principal Cities of U. S. & Canada

OAKITE SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

E-125019

Low-Cost Hydraulic Control Valves

Features claimed: Open-center, double spool type, offered in 3-way or 4-way combination styles. Designed for smooth operation and accurate, responsive control, sturdily constructed. Operate at pressures up to 2,000 psi., have an externally-adjustable built-in balanced seatless relief valve. Any port size up to ¾" pipe size. Operating handles mounted at either end of valve, upright or inverted. Moving parts are made of hardened steel.



Manufacturer: Parker Appliance Co.

E-125020

No More Spilled Drawers

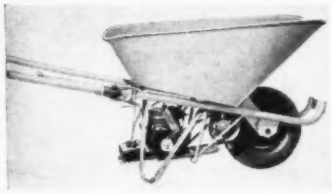
Features claimed: A new metal extension drawer support that makes it possible for woodworking plants to manufacture wooden drawers that function with the precision of metal filing cabinets. Minimum of parts, minimum installation cost. No screws used except to secure stationary "tracks." Drawers can be opened fully, so that drawer backs are even with front of the case, without slightest danger of drawers falling. Drawers work easily—you can push a 48" drawer closed from fully open, with one finger from the corner, without any binding action. Drawers can be lifted free for cleaning purposes. Up to 2" height can be added to drawers by new construction methods.

Manufacturer: Extension Drawer Support Co.

E-125021

Glamorizing the Wheelbarrow

Features claimed: A self-powered wheelbarrow that will put a full load up a 40% grade. Engine compression acts as a brake on the downgrade, and speed on the level is a comfortable walking pace. Air cooled engine is mounted beneath the bed, and drives by friction on the tire tread. Simple controls are on the right handle.



Manufacturer: S and S Vending Machine Co.

E-125022

Quick-opening Flush Latch for Aircraft

Features claimed: Series M-1000 Tite-Seal Latch in use on aircraft doors can be operated in flight accidentally only by forces strong enough to cause structural damage. On the ground, finger-tip pressure is enough to operate it. Rubber gaskets around latch openings make latch splashproof, moisture-proof, and minimize air leakage. Latch weighs only one ounce, made of stainless steel. Permanently attached to doors with four ⅛" dia. rivets spaced 1-1/16" on center. Overall length is 3⅛". Withstands extreme

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loads, vibrations and accelerations experienced in high-speed flight.

Manufacturer: Modern Metal Spinning & Mfg. Co.

E-125023

Miniature Ion Exchange Unit

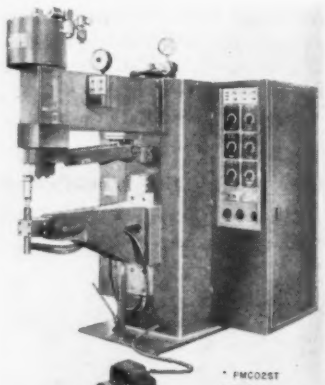
Features claimed: This new and refillable ion exchange unit delivers from an ordinary faucet, water equal in chemical quality to triple-distilled. Designed principally for small-quantity uses for purposes such as soil analysis; photography, general lab work. Provides water of extremely high quality for storage batteries (truck fleet operators). Tube is 8½" long, 1⅝" dia., filled with Amberlites that change color when exhausted, indicating refill time. Normally, 10 gals. of water (lab quality) may be expected from each unit.

Manufacturer: LaMotte Chemical Products Co.

E-125024

Resistance Spot Welder with Quick Adjustment for Aluminum, Ferrous and Nonferrous Alloys

Features claimed: This machine can be quickly and easily set, by change of manual controls, to weld aluminum, magnesium, stainless steel, Inconel, Monel, brass, mild steel, and other alloys. Various thicknesses of these metals can be handled. Known as Sciaky PMCO2-ST, it is a press type machine rated at 100 KVA. at 50% duty cycle. It operates on 220 and 440 volts, three phase, 60 cycle current. Standard throat depth is 36". Welding range on low carbon steel is from .022" to .156" (two thicknesses) and on aluminum and magnesium alloys a range from .025" to .081". Ranges for other metals vary.



Manufacturer: Sciaky Bros.

E-125025

Production Line Bonding Agent

Features claimed: Bonding Agent R-313 is a production line speeder-upper where metal must be bonded to metal, as in sleeves, bushings, etc. It will secure such dissimilar materials as glass, plastics, neoprene, leather, etc., to metals of all types. It quickly bonds ferrous metals to non-ferrous metals. Clamps are not necessary. It is chemically inert to concentrated acids and alkalies at room temperature. It has excellent electrical properties, and will withstand heat in range from —100° F. to 400° F.

Manufacturer: Carl H. Biggs Co.

E-125026

Night Time Identification For Your Rolling Stock

Features claimed: Letters, stripes, etc., die-cut, correctly shaped and held that way for proper application, made of "Scotchlite" reflective sheeting. This enables in-

experienced shop men to apply "Scotchlite" to vertical surfaces (such as truck bodies) without waste. Prevents wrinkling, stretching, misplacement during application without using special equipment. Complete ICC, PUC, other identification numbers, firm names, etc., can be applied in one operation quickly and accurately. Material can be furnished in almost any style and color, from two inches up. Samples and price list on request.

Manufacturer: By-Buk Co.

E-125027

New Lubricant Additive

Features claimed: Protektoil is a highly developed light viscosity heat resisting lubricant of very high film strength (38,000 lbs. per sq. in.) with a pour point of 107 degrees below freezing. Permits deeper draws on pressed metal without galling, reduces wear and operating temperatures

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H. H. McVeigh.....West 310 First Ave., Spokane 8, Wash.
Equipment Supply Co.....60 Richards St., Salt Lake City 1, Utah
McDonald-Hunt Scale & Supply Co.....1540 Wazee St., Denver 2, Colo.
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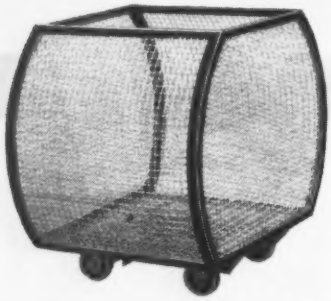

• • • were first made as retort baskets for the food processing industries. They are designed to withstand both heat and abuse and have many applications in the handling of parts and packages. Write for full details.

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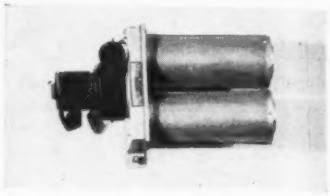
Manufacturer: Protektoil Corp.

E-125028

Air Improver

Features claimed: An indoor ventilating device that continuously draws room air through activated carbon to remove any odors and discharge a stream of pure air. Consists of two metal cannisters that contain three lbs. of activated carbon, and a quiet 3,000 rpm. motor-blower that circulates the air at the minute. Overall length is 18". May be fastened at any convenient point, and uses no more electricity than a small light bulb.



Manufacturer: W. B. Connor Engineering Corp.

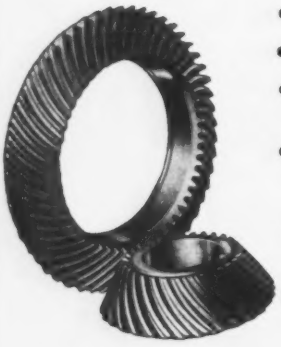
E-125029

Lubricant Spray Valve

Features claimed: With this Farval Spray Valve, either grease or oil can be sprayed onto open gearing, slide surfaces, or any other area where it is desirable to apply a measured amount of lubricant at regular intervals. Valve can be operated wherever compressed air is available.

Manufacturer: Farval Corp.

GEARS



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How to Lubricate Degreasing Equipment

EFFECTIVE lubrication of conveyor chains which pass through vapor degreasers cannot be accomplished with ordinary petroleum products. If such are used, they are removed with all oils and greases in the passage of the chains through the degreaser tank.

The more petroleum lubricant applied to the chains, the harder the degreaser has to work to remove it. This contaminates the degreaser solvent faster.

There is one high temperature lubricant that is successful in this application because of its chemical inertness. It is colloidal graphite, a microscopically fine substance which lubricates effectively from sub 0° to 3000° F. plus. Because of its extreme chemical inertness it is unaffected by degreaser solvents, and hence ideal for the purpose outlined.

Colloidal graphite dispersed in alcohol should be used on degreaser chains. The alcohol acts as a medium to transport the graphite to the points requiring lubrication. It is usually applied immediately after the chain leaves the degreaser tank and while it is still warm.

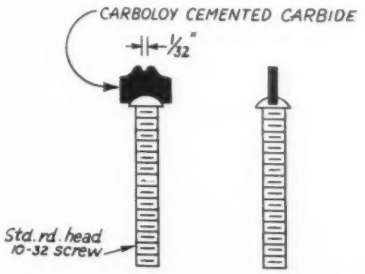
By the time the chain completes its cycle and returns to the tank the alcohol has evaporated and the dry lubricating film is in position to carry the load. So says Acheson Colloids Corp., Port Huron, Mich., a manufacturer of colloidal graphite.

Meeting to Discuss Practical Methods of Cost Reduction

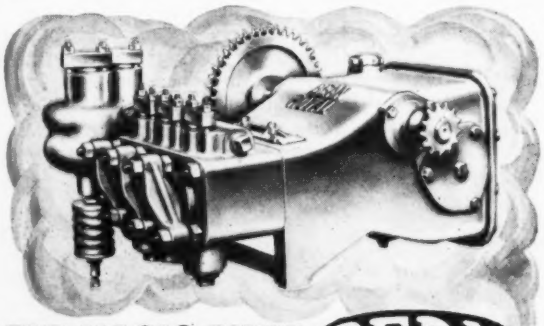
THE UNIVERSITY of California will hold its Third Annual Industrial Engineering Institute on February 2 and 3, 1951 in Lewis Hall on the Berkeley campus. The two-day meeting will include sessions on Work Simplication, Time Study, Standard Data Systems, Production Engineering and Human Engineering and are slanted towards practical methods of cost reduction.

Speakers who will participate include:

R. Conrad Cooper, Vice President of U. S. Steel, Pittsburgh, Pa.
J. H. Quick, President, The Work-Factor Company, New York.
Dr. M. E. Mundel, Chairman, Industrial Engineering, Purdue University.
W. E. Hodson, Methods Engineering Council, Pittsburgh, Pa.
J. A. Richardson, The Ford Motor Company, Richmond, California.
Mason Haire, Professor of Psychology, University of California.
Harry M. Hughes, Lecturer, Statistical Laboratory, University of California.
E. P. DeGarmo, Professor, Mechanical Engineering, University of California.
H. S. Kaltenborn, Professor, Industrial Relations, University of California.
Wm. Gomberg, Director, Management Division, ILGWU, New York.
L. L. Sammet, Bureau of Agricultural Economics, Berkeley.
T. E. Piper, Chief Materials and Process Engineer, Northrop Aircraft Co., Hawthorne, Calif.
W. A. Nordoff, Santa Monica Engineering Co., Los Angeles, Calif.
Ralph M. Barnes, Professor of Engineering and Production Management, University of California at Los Angeles.



AN IDEA FOR PRODUCING SMALL END MILLS—Mills are made of standard Carboloy 883 blanks simply brazed into slot in head of 10-32 round head screw. Blanks are then ground to shape and end mill is finished. Idea was developed in shops of General Electric Co. The mills are used for machining oil grooves in sleeve bearings.



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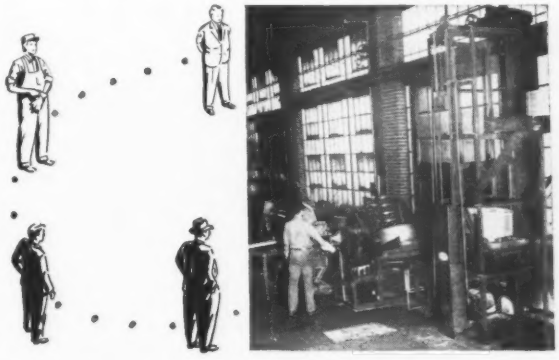

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READING GUIDE FOR WESTERN MANAGEMENT

A service for all management levels . . . current literature surveyed and appraised by the faculty of the School of Management, Golden Gate College

Working With People

By Auren Uris and Betty Shapin, Macmillan Company, New York, 1949, $3.00.

Using the semi-fictional or case method, the authors explore methods and techniques for working successfully with people. They urge managers to solve supervisory problems before they arise, by minimizing friction and at the same time increasing the contribution of each individual to the total group job.

The usual objection of abstraction, so often encountered in books on human relations, is successfully avoided.

Reviewed by:
PETER WEINBERGER
Lecturer in Human Relations

* * *

Backgrounds of Power

By Roger Burlingame, Charles Scribner's Sons, New York, 1949, $5.00.

Americans interested in their country's history, as well as those whose interests are industrial, may read this book as they might a fine, arresting novel. There may be a reluctance to put it aside until late at night when tired eyes and the thought of the next day compel it.

Origins of mechanization, coincidence of economic conditions and social movements with the use of power in manufacturing, and guiding motivations and concepts in the development of modern civilization are explored and analyzed in the light of their effects upon events that led to Mass Production and its results. One result, of course, is a society with mechanical slaves to lighten labors and extend hours available for leisure, recreation, and cultural pursuits—if that be our choice. But the Machine cannot destroy Man, as some half believe, because Man is at the controls. However, perhaps he needs to take steps to remain there.

In this book are facts known to few, and a novel presentation and evaluation of those facts. We are reminded, for example, that long before Gutenberg's printing press, there came—"the automatic machine which began the whole evolution toward the industrial age—and which now dominates that age—the instrument for measuring time."

We are given brief glimpses of intriguing vistas as we follow the author from primitive times to the world of today, meeting all too briefly with ingenious and colorful men who contributed much to that world. The footnotes and bibliography are there, too, so that he who senses a fascinating story behind the brief reference may follow the trail through additional sources.

Mr. Burlingame is skilled in marshalling his data, and logically developing his story of the impulses and continuing forces in the progress of mankind to its present industrial and social status. He is also a master of the English language. His words flow as smoothly as the materials in the mass production he discusses.

Reviewed by:
J. H. AIKEN
Lecturer in Production Management

* * *

Briefer Guides From The Management Library

Seniority Systems in Nonunionized Companies

National Industrial Conference Board, New York, Studies in Personnel Policy, No. 110, 1950.

"How secure is my job? On what basis will my company promote or transfer me?" Whether a union member or not, these questions are of great importance to each employee. This study analyzes the formal seniority systems set up by 110 nonunion firms.

The Cost and Financing of Social Security

By Lewis Meriam, et al. Brookings Institution, Washington, D. C., 1950, $3.00.

Increasing attention is being given to individual security, with the federal government providing more and more protection. This study focuses attention on the expanding costs and the problems involved in financing them.

Inspection Organization and Methods

By James E. Thompson. McGraw-Hill Book Co., Inc., New York, 1950, $5.00.

Here are tested methods for simplifying procedures, improving efficiency, and reducing costs in inspection departments. The procedures given may be applied regardless of the product being made or the quality level being maintained.

Bonds of Organization

By E. Wight Bakke. Harper & Bros., New York, 1950, $4.00.

What are the factors that underlie good teamwork within a business organization? Here is an appraisal of corporate human relations which

throws new light on the dynamics of industrial relations and their effective application.

The History of an Advertising Agency

By Ralph M. Hower. Harvard University Press, Cambridge, Mass., 1949, $7.50.

A detailed and documented study of one of the oldest and largest advertising agencies in the world, N. W. Ayer & Son. The firm's development is traced from 1869 up to the present time.

An Analysis of Group Life Insurance

By D. W. Gregg. University of Pennsylvania Press, Philadelphia, 1950, $3.75.

Group life insurance today covers more than twenty million persons with an amount in force of more than $40 billion. This book presents a historical sketch of the origin and development of group life insurance. The fundamental nature of group life is explained; and a detailed analysis is made of the cost structure with a direct comparison of mortality and expense rates for group and ordinary insurance.

Economics of Transportation

By M. L. Fair and E. W. Williams, Jr. Harper & Bros., New York, 1950, $5.50.

Here is a complete treatment of the economics of our transportation system—rail, air, water, highway, and pipeline. The authors consider transportation as a function of American economic development and activity. They discuss transportation services, rates and their applications, transportation agencies and their functions.

Routing and Misrouting of Freight

By Glenn L. Shinn. Simmons-Boardman Publishing Corporation, New York, 1949, $4.00.

This book covers the rights, obligations, and liabilities of railroads and shippers in all kinds of routing and misrouting problems. The author explains the right of the shipper to route his freight; the obligation of the railroad to observe such routing or to supply routing when none is specified; and the liability of the railroad for damages to the shipper for misrouting.

The Commerce of Nations

By J. B. Condliffe. W. W. Norton & Company, New York, 1949, $7.50.

Here is a history of world trade from the caravans of the ancient world to the barter agreements and currency blocks of today. Mr. Condliffe analyzes the modern trend to collectivism, the effects of war on the world and national economics, the weapons of economic warfare, and the instruments of international cooperation.

Reviewed by:
BERNA M. CARLSON
College Librarian

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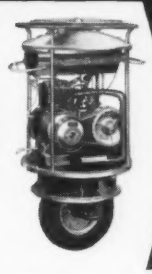

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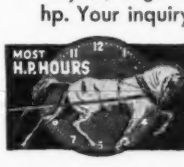

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125030-L

LIGHT DUTY DRILL PRESSES—A brochure, replete with photographic illustrations, on the company's Series 1600 light duty drill presses, which includes 12 models in one, two, three and four spindle units, bench and floor type, has just been published by *Boice-Crane Co.*, 955 Central Ave., Toledo 6, Ohio. Assembly parts for special setups, tapping machines and a complete line of accessories are also included.

125031-L

DATA ON INSULATION RESISTANCE TESTERS—Vibrotest Bulletin 2A gives full data on 29 Vibrotest models, having resistance testing ranges from 100 to 50,000 megohms, with test potentials from 125 to 1,000 volts DC. Several Vibrotest models have additional low-ohm ranges, and AC and DC ranges. Published by *Associated Research, Inc.*, 3758 Belmont Ave., Chicago 18, Ill.

125032-L

WHEELABRATING ELIMINATES ACID PICKLING—"How Wheelabrator Blast Cleaning Solves Acid Pickling Problems" is the name of Bulletin No. 584A, now available from *American Wheelabrator & Equipment Corp.*, 555 S. Byrkit St., Mishawaka, Ind. The story of how this airless blasting process has influenced cleaning speeds, costs, safety, etc., and how it eliminates acid disposal in various applications is told in case study form.

"Now You Can Supply Uncle Sam's Needs and Make Money At It"

REPRINTS of this article from the August issue, showing how to do business with the government, are available free. Address Circulation Manager, *Western Industry*, 609 Mission St., San Francisco 5, Calif.

125033-L

WATER TREATMENT PROGRAM—A bulletin entitled "The Nalco System of Water Treatment as Applied to the Modern Self-Contained Boiler" has been published by *National Aluminate Corp.*, 6272 West 66th Place, Chicago, Ill. Through a service contract plan, the company has made available to packaged boiler users essentially the same water treatment program used in many

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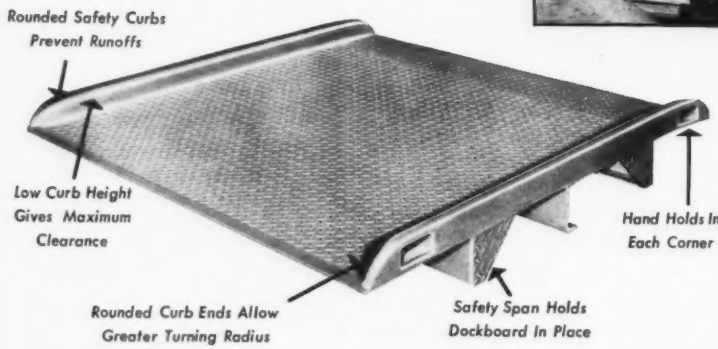
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of the nation's largest power plants. This bulletin points out the need for water treatment and explains the four essential points of the Nalco system—namely, service, chemicals, feeding and control.

125034-L

ANTI-CORROSION COATING — Corrosion resistance superior to conventional zinc coatings with cost savings is claimed for Zincilate, the one-coat, self-protecting, anti-corrosion coating described in an 8-page illustrated technical bulletin published by *Industrial Metal Protectives, Inc., 401 Homestead Avenue, Dayton 8, Ohio.* The bulletin presents case histories on outstanding companies and typical applications showing Zincilate's exceptional resistance to severe abrasive and corrosive conditions; complete specifications for the two Zincilate formulations; data on surface preparation and methods of application; and an offer of providing process engineers to investigate corrosion problems and supervise applications.

125035-L

TRANSMISSION BELTING—*Thermoid Company, Trenton, N. J.,* makes available a concise, technical bulletin on flat transmission belting as an aid to plant engineers and operating personnel in selecting the right transmission belt to meet their individual problems. The bulletin contains complete formulae, charts and tables for the proper selection of transmission belting. Copies of the new Transmission Belting Bulletin, Form 3678, are available on request.

125036-L

AID TO WINTER VACATIONS—To aid those who are planning winter vacations, the Santa Fe Railway has issued a new booklet entitled "Indian Country of the Southwest," which provides the rail traveler with a general introduction to the land of the friendly red man. Twenty-eight spectacular pictures accompany thumbnail descriptions of this year-round holiday land. They spotlight for the reader such world wonders as Canyon de Chelly, Monument Valley, Canyon Del Muerto, Rainbow Bridge, Painted Desert, Hopiland, Taos, Zuni, Acoma, Oraibi, San Ildefonso, Santa Clara and Jemez Pueblos, and many national parks and

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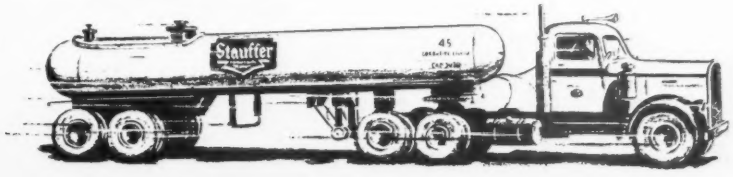

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monuments. For copies of this free booklet write *R. T. Anderson, general passenger traffic manager, Santa Fe Railway, 80 East Jackson Boulevard, Chicago 4, Illinois.*

125037-L

PROCESS PLANT MAINTENANCE—A well illustrated, concisely written 4-page folder is available for the asking from *Oscar Krenz Incorporated, Ashby Avenue at Sixth Street, Berkeley 10, California.* This brochure gives the inside story on their complete maintenance and repair service for process plants. It includes discussion and illustration of engineering, disassembly and removal of equipment, fabrication, and reinstallation of equipment.

125038-L

HARD METAL CASTINGS — *Stoody Company, Whittier, California,* offers a 16-page pamphlet describing the use and types of Stoody hard metal alloy castings. The book is well illustrated, showing numerous current specimens of Stoody castings, with some specifications and prices included. Parts cast by Stoody Company are generally those subjected to severe abrasion often in combination with high temperatures, corrosion or impact.

125039-L

FACTS ABOUT OIL—A compact collection of facts and figures on the domestic oil industry, based on latest available information from recognized government and industry sources, published by the Department of Information of the American Petroleum Institute. The 32-page booket is an informative summary intended for use as reference and background by speakers, editors, students, writers and others needing a quick, handy guide to up-to-date information. It is not intended as a narrative story of petroleum. Copies of "Facts About Oil" are available in quantity for company distribution at a cost of $6.00 per hundred. Single copies may be obtained upon request from the *Western Oil and Gas Association, or the API Department of Information, 50 West 50th Street, New York 20, N. Y.*

125040-L

P-10 PUMP CATALOG—The complete line of JAEGER sure-prime contractors pumps is described and illustrated in a 50-page catalog just off the press. It is broken down into sections so that anyone desiring information on a certain type of pump will receive that section in which he is interested. The complete catalog or any section thereof is available to anyone writing *The Jaeger Machine Company, 550 West Spring Street, Columbus 16, Ohio.*

125041-L

OVERHEAD GUARD DEVICE—A new Accessory Data Sheet covering the Overhead Guard device for use on Towmotor Fork Lift Trucks has just been announced by Towmotor Corporation. The Overhead Guard is designed to provide maximum protection for lift truck operators, and may be easily attached right in the field by bolts and clamps which are furnished. Address *Literature Department, Towmotor Corporation, 1226 E. 152nd Street, Cleveland 10, Ohio.*

125042-L

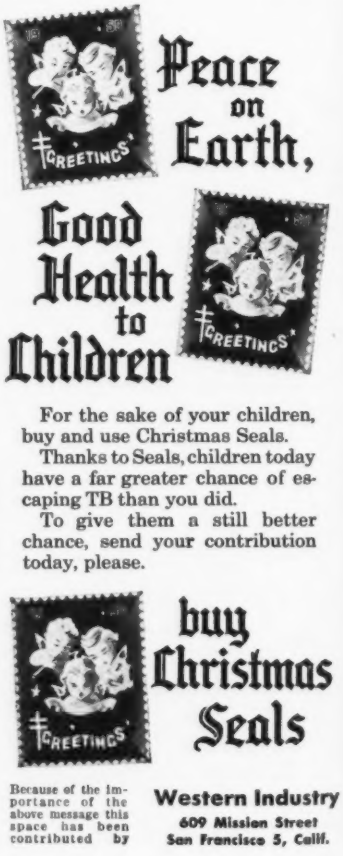
ESCO "SPUNCAST"—A new bulletin, No. 184, released by *Electric Steel Foundry, 2141 N.W. 25th Avenue, Portland 10, Oregon*—contains a blow-by-blow account of a foundry at work producing centrifugal castings to exacting requirements. Crammed with pictures, descriptions and specifications, it's a story of interest to everyone having steel requirements. Depicted, in addition to actual foundry production steps, are many finished products accompanied by captions describing their final applications. It is a bulletin designed to tell you how much can be done with ESCO "SPUNCAST" and why it can be done at a substantial saving. Applications are found in every industry where symmetrical shapes, IPS pipe, tubes and cylinders are needed.

125043-L

COMPRESSION-FORMED TUBING—A new 8-page folder (R-3) titled "Compression-Formed Tubing" is available gratis from *Tube Reducing Corporation, Wallington, New Jersey.* Text material describes the compression-forming process, tolerances, surface finish, decarburization, mechanical properties, types, shapes and sizes. The folder gives profilometer readings and shows how the compression-forming process increases mechanical properties of steel. Photos show how dies compress tubing over a mandrel, typical close-tolerance parts that can be produced including tapered and special internal bore shapes.

125044-L

VEST-POCKET SOLDERING COURSE—An up-to-the-minute edition of "Soldering Tips," popular 20-page pocket manual of soldering has been published by Weller Electric Corp., Easton, Pa., makers of Weller Soldering Guns. Designed as a handy reference for professionals, and a complete, simplified soldering course for new comers, the new handbook covers every important phase of soldering in easy, understandable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125045-L

POWERED HAND TRUCKS—The new powered hand trucks recently announced by the Clark Equipment Company are described in detail in a 12-page, two-color booklet just off the press. Separate sections of the book are devoted to each of the two power types: the Electro-Lift, battery-powered and motor driven; and the Hydro-Lift, gas-powered and driven by hydraulic pump and hydraulic motor. The center-spread provides data concerning the mounting of the drive motors—both electric and hydraulic—inside the drive wheel; turning radius; the frame and other major units common to both power types and other important features. A copy of the booklet is available upon request to the *Clark Equipment Company, Industrial Truck Division, Battle Creek, Michigan.*

125046-L

RUBBER DEVELOPMENTS—A quarterly publication of The British Rubber Development Board, contains the announcement of a new device for centralizing the load on conveyor belts and at the same time ridding the belt of dust or sticky materials. Other developments discussed in the magazine include the use of rubber in recent engineering advances in motor vehicles, ships and railroad equipment, and a new line of anti-vibration mountings for heavy machinery and delicate instruments. Copies of the current issue of "Rubber Developments" are available free of charge from the *National Rubber Bureau, Dept. S-50, 1631 K Street, N.W., Washington 6, D. C.*

125047-L

MATERIALS HANDLING EQUIPMENT—A new two-color illustrated 8-page catalog offered by *M. E. Canfield Company, 420 East Third Street, Los Angeles 13, California,* covering their complete line of material handling equipment. Of particular interest is their service of individually designed and engineered equipment suggested after careful survey of the problem involved. Canfield also stresses their custom built items for special uses. Direct factory distributors for Lewis-Shepard, Arrow Products, Inc., Economy Baler, American Pulley Company and Rapid Standard.

125048-L

ADVERTISING REPRINTS AVAILABLE—A series of 8½" x 11" reprints on what to do about advertising when you are sold up to the hilt, when to stop it, and what jobs to assign to it in a sellers' market are now available from *The Schuyler Hopper Company, 12 East 41st Street, New York 17, N. Y.* As many copies as needed are available without charge or obligation to any publisher or advertiser or executive who will write for them. This series is devoted specifically to such advertising problems as confronted business executives in the economy of 1941-45. It shows how to avoid the confusions which might seriously damage a company's reputation and impair its standing in markets "short rationed" by defense commitments. It shows executives what to do about new policies, prices, allocations and deliveries when they haven't enough salesmen (or the salesmen haven't enough time) to get all that they want told, to all of the people they want to know it, as often as they want to get it to them. Yes, and it tells what to do when salesmen quit beating the bushes for business.

125049-L

ELECTRIC MOTOR LUBRICATION—Interesting studies in bearing lubrication for electrical motors are presented in a new bulletin entitled "Lubriflush," issued by U. S. Electrical Motors, Inc. It graphically shows comparative amounts of lubricant in different designs of bearings and how bearings are subject to air circulation. Application of U. S. Motors' Lubriflush principle is presented, showing how bearings can be lubricated for life and also can be purged of old lubricant and renewed without disturbing the bearing housing. The Bulletin, No. 1579, may be obtained by writing *U. S. Electrical Motors, Inc., 200 E. Slauson Avenue, Los Angeles 54, California.*

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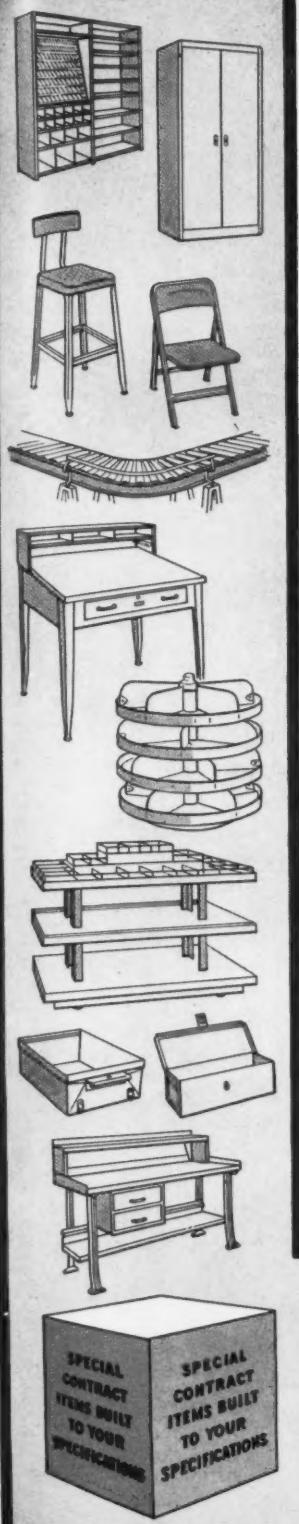

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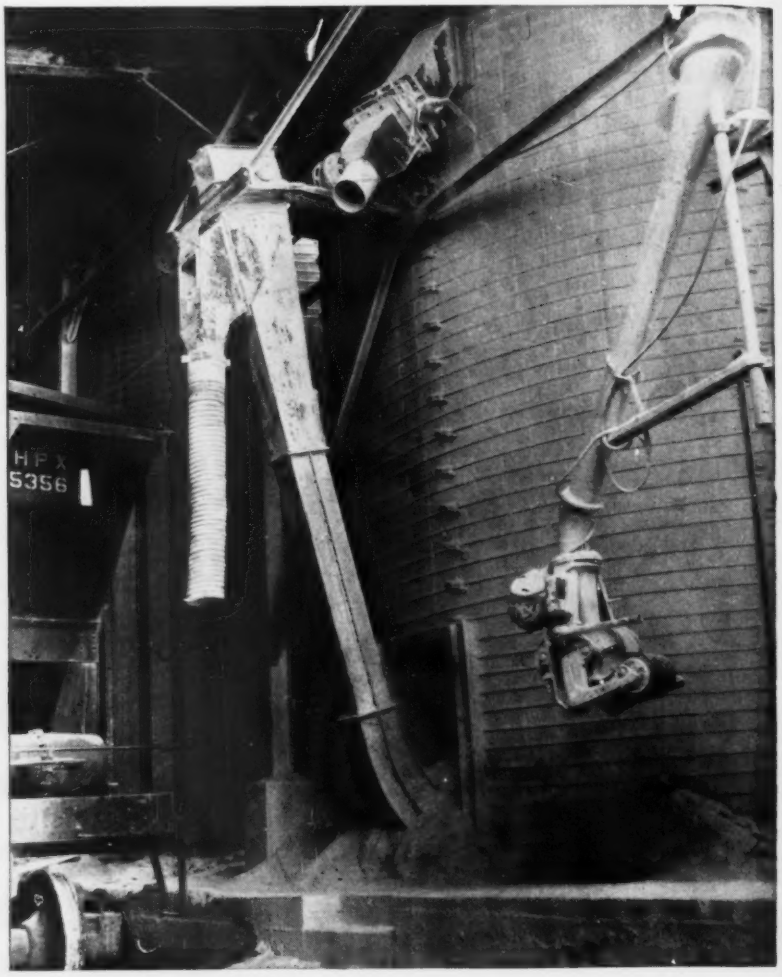

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